BUDNIKOV, P. P.

"Gazha: A Natural Mixture of Gypsum and Mud," Priroda, No. 11, 1949.

"The Vitreoceramics Problem," Ogneupory, No. 9, 1949. Act. Mbr., Acad. of Sci., Uk SSR, -c1949-.

"The Role of Russian Scientists in Gypsum Studies before the Revolution," Prioroda, No. 10, 1949. Act. Mbr., Acad. Sci., Ukr SSR, -c1949-.

BUDNIKOV, P. P. i KOSYREVA, Z. S.

26408 Shchelochenpornaya futerovra. Sbornik nauch. Rabot po vyazhushchim materialam. m. 1949, s. 43-52.

SO: LETOPIS' NO. 35, 1949

BUDNIKOV, P. P. i STRELKOV, M. I.

26409 K voprosu polucheniya alitovogo tsementa metodom dvoynogo obzhiga. Svornik nauch. Rabot po vyazhushchim materialam. m. 1949, s. 34-42.

SO: LETOPIS' NO. 35, 1949

BUDNIKOV, P. P.

BUDNIKOV, P. P. I MCHEDLOV-PETROSYAN, O. P.

36182 "Gazha"-prirodnaya smes' gipsa i gliny--baza dlya izgotovleniya vyazhushchikh materialov. Priroda, 1949, No. 11, S. 51-52.--Bibliogr: 9 nazv.

SO: Letopis' Zhurnal'nykh Statey, No. 49, 1949

BUDNIKOV, P.P.

35325. BUDNIKOV, P.P. Shlakovye tsementy s povyshennym soderzhaniem okisi magniya. Trudy Mosk. Khim.-Tekhnol. In-Ta Im. Mendeleeva, Vyp. 16, 1949, S. 3-10

SO: Letopis' Zhurnal'nykh Statey Vol. 34, Moskva 1949

BUDNIKOV, P. P

35324. Voprosu O Fiziko-Khimcheskoy Prirode Spekaniya Keramicheskikh Materialov. Trudy Mosk. Khim. - Tekhol. In-Ta Im. Mendeleeva, Vyp. 16, 1949, s.73-86-Bibliogr: 15 Naz v.

SO: Letopis 'Zhurnal 'nykh Statey, Vol, 34, Moskva, 1949

BUDNIKOV, P. P.

Raising the water resistance of materials from gypsum clay. P. P. Budnikov and O. F. Mechedlov Petrosyan. Zhur. Prikład. Khim. (J. Applied Chem.) 22, 217-22 (1949).--Tests were conducted with Orkhevi gypsum clay (I) analyzing SiO_2 12.26, Al_2O_3 + Fe_2O_3 10.00, CaO 24.15, MgO 1.77, SO_3 32.71, and ignition loss 16.76% and also Kaspi gypsum clay (II) analyzing SiO_2 24.13, Al_2O_3 + Fe_2O_3 7.50, CaO 22.10, MgO 0.60, SO_3 23.22, and ignition loss 22.15%. Petrographic analysis of I showed a large amt. of gypsum crystals, smaller amts. of quartz and plagioclase, occasional crystals of monoclinic pyroxene and biotite, and spots of limonite. II showed gypsum crystals, calcite, cryst. quartz, crystals of feldspar, and Fe oxide. Calcination of I at 780 and 880° for 2 hrs. resulted in SO_3 loss of 5%; for II it was 8% after 2 hrs. at 900°. Calcined I was mixed with 5, 10, and 15% slaked lime and formed into specimens with sand (1:3); compression and tension tests were made after air and water storage. In all cases, the optimum lime content was 5%; greater strength was obtained with clay calcined at 880° than at 780°. Samples stored in water showed greater strength than those stored in air after 28 days. After 28 days' storage in water, max. compressive strength was 38.6 kg./sq.cm. and tensile strength 10.3 kg./sq. cm. Petrographic analysis of II calcined at 900° showed scattered crystals of anhyd. gypsum, small adiagnostic grains of quartz and also highly birefracting crystals with an index close to that of $2CaO.-SiO_2$. Test samples made of calcined clay with sand (1:3) but without lime had compressive strength of 55 kg./sq.cm. and tensile strength of 11 kg./sq. cm. after 28 days' air storage. Samples showed no washout after being kept in running water (about 10,000 l.). Samples remaining from the 28-day tests were subjected to alternating wetting and drying and, when tested after 8 yrs., showed compressive strength of 105 kg./sq.cm. Microscopic study revealed uniform distribution of quartz grains which were evenly

OVER

BUDNIKOV, P. P.

USSR/Engineering
Building Materials
Cement

Mar 49

"Problem of Increasing the Water Resistance of 'Gazha' Materials," P. P. Budnikov, O. P. Mchedlov-Petrosyan, 5 pp.

Zhur. Priklad. Khim., Vol. 22, No. 3

Raw "gazha" when mixed with clay or similar bonding agent has high resistance to water. Heat treatment of this substance produces a substance almost impervious to water. It has been used successfully in manufacture of a "gazha" cement composed of clay, gypsum and small quantities of"gazha." A 50% mixture of gypsum and "gazha" was stored for 8 years in its combined form and when used still had excellent water resistant and mechanical qualities. Submitted 5 Apr 48.

48/49T32

PA 39/49T35

USSR/Engineering Apr 49
Slag, Blast Furnace
Magnesium Oxide

"Effect of Magnesium Oxide on the Hydraulic Activity of Blast-Furnace Slags," P. P. Budnikov, Corr Mem, Acad Sci USSR, Z. S. Kosyreva, Chemico-tech Inst imeni D. N. Mendeleyev, 4 pp

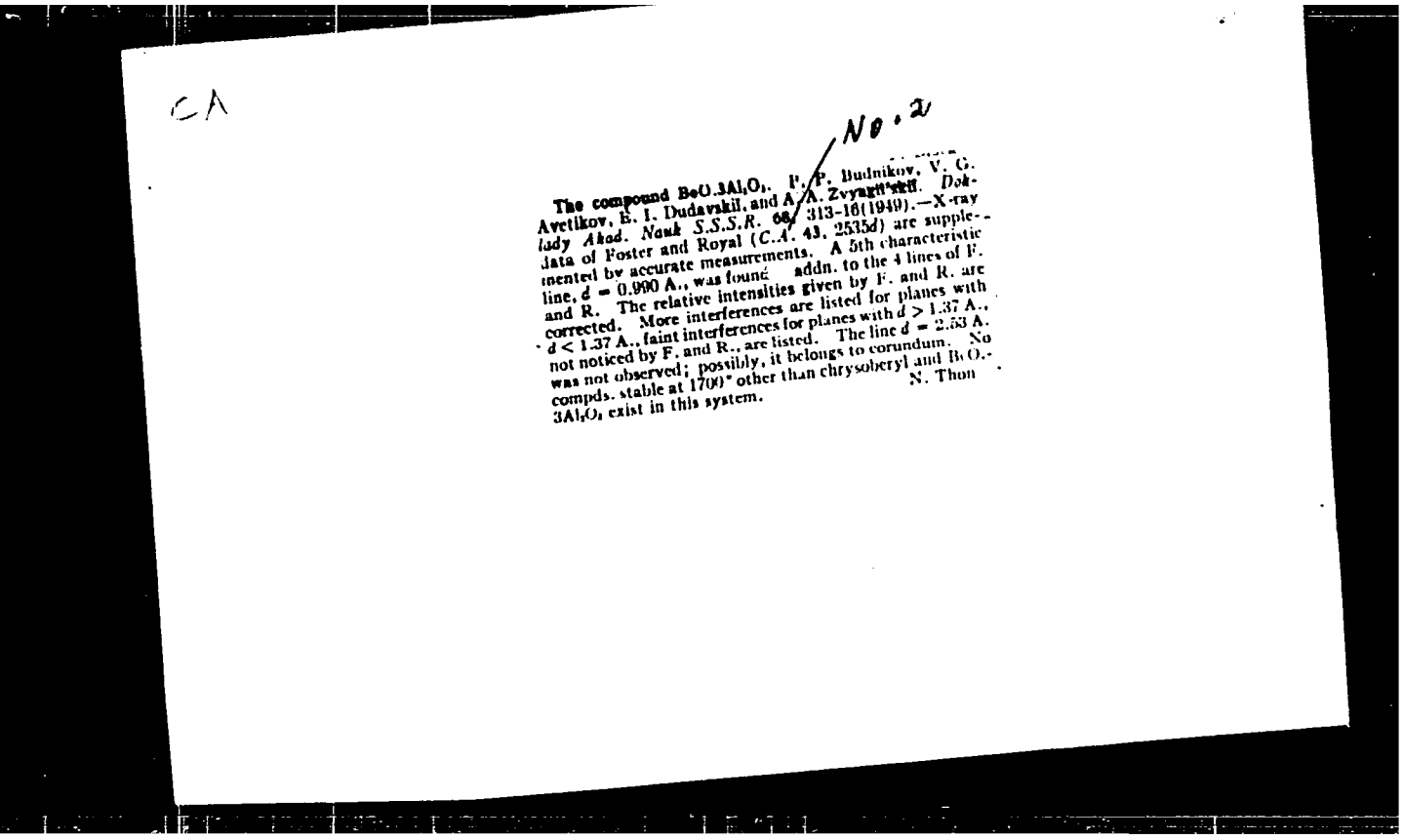
"Dok Ak Nauk SSSR" Vol LXV, No 5

Studied influence of varying contents of MgO (2 - 10%) in blast-furnace slags on their hydraulic characteristics for Portland-slag and clinkerless cements. Submitted 9 Feb 49.

[redacted] 39/49T35

BUDNIKOV, P. P.

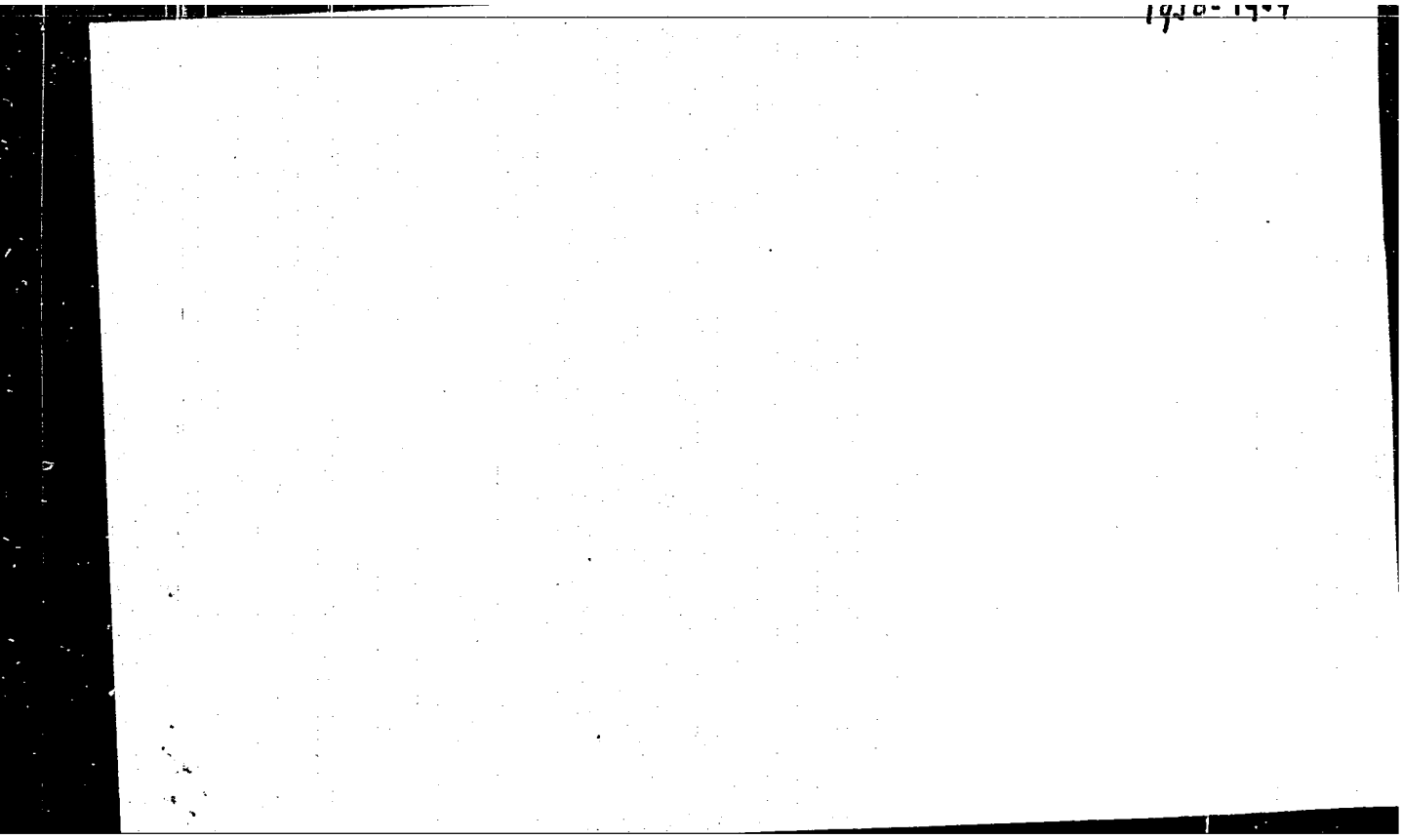
New method of determination of the temperature of beginning agglomeration of powdered dielectrics. P. P. Budnikov, V. M. Barro, and O. I. Mchedlov-Petrosyan. *Doklady Akad. Nauk S.S.S.R.* 67, 113-15(1949).—The temp. is detd. by the rupture of oscillations of a generator attuned to a const. frequency, in a circuit contg. the powder. With the capacitance and the inductance kept const., the point of rupture corresponds to the sudden change of the elec. resistivity of the powder as a result of beginning conglomeration. With a tech. Na silicate powder of 1.5–0.6 mm. grain size, the temp. of beginning agglomeration was thus detd. to 75° ± 8°. N. Thou



CA

No. 2

The compound $BeO.3Al_2O_3$. F. P. Budnikov, V. G. Avetikov, B. I. Dudavskii, and A. A. Zvyagintsev. *Doklady Akad. Nauk S.S.S.R.* 68, 313-16(1949).—X-ray data of Foster and Royal (*C.A.* 43, 2535*d*) are supplemented by accurate measurements. A 5th characteristic line, $d = 0.990$ A., was found addn. to the 4 lines of F. and R. The relative intensities given by F. and R. are corrected. More interferences are listed for planes with $d > 1.37$ A., $d < 1.37$ A., faint interferences for planes with $d > 1.37$ A., not noticed by F. and R., are listed. The line $d = 2.53$ A. was not observed; possibly, it belongs to corundum. No compds. stable at 1700° other than chrysoberyl and $BeO.3Al_2O_3$ exist in this system. N. Thon



BUDNIKOV, P. P.

PHASE X TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 707 - X

Call No.: TP807.B9

BOOK

Authors: BUDNIKOV, P. P., A. S. BEREZHNOY, I. A. BULAVIN, B. M. GRISSIK, G. V. KUKOLEV and D. N. POLUBOYARINOV

Full Title: MANUFACTURE OF CERAMICS AND REFRACTORY MATERIALS

Transliterated Title: Tekhnologiya keramiki i ogneuporov

PUBLISHING DATA

Originating Agency: None

Publishing House: State Publishing House of Literature on Construction Materials

Date: 1950 No. pp.: 575 No. of copies: 4,000

Editorial Staff

Editor: P. P. Budnikov, Member of the Academy of Sciences, Ukrainian SSR

PURPOSE AND EVALUATION: This manual is approved as a textbook for institutes of chemical technology and of construction materials and for students specializing in the technology of silicates. The book compares favorably with its American counterparts, e.g., volume III of Ceramics by Ed. P. McNamara (State College, Pa., 1939) and Factory Design and Equipment and Manufacture of Clay Wares by T. W. Garve (N.Y., 1929). All phases of manufacturing are extensively covered and the book can be used as a reference

Tekhnologiya keramiki i ogneuporov

book. It contains much data on materials used in the USSR.

TEXT DATA

Coverage: The textbook is divided into three parts (See table of contents): 1) coarse ceramics used in construction work; 2) refractory materials, their treatment and processing, and 3) fine-grade ceramics. The third part of the book (Chapter IX) contains information on the manufacture of: products with high-alumina content (insulators, refractories, porcelain for chemical laboratories; corund insulators; talcum-clay insulators; steatite, titanium-magnesium and other products for high-frequency equipment; pyrophyllite products; and cordierite products as used in aviation, electrical and radio equipment and the manufacture of measuring instruments. The book does not give a detailed description of kilns, dryers and other mechanical equipment used in the processes.

Table of Contents

AID 707 - X

Tekhnologiya keramiki i ogneuporov

Part One: Coarse Ceramics Used for Construction Work

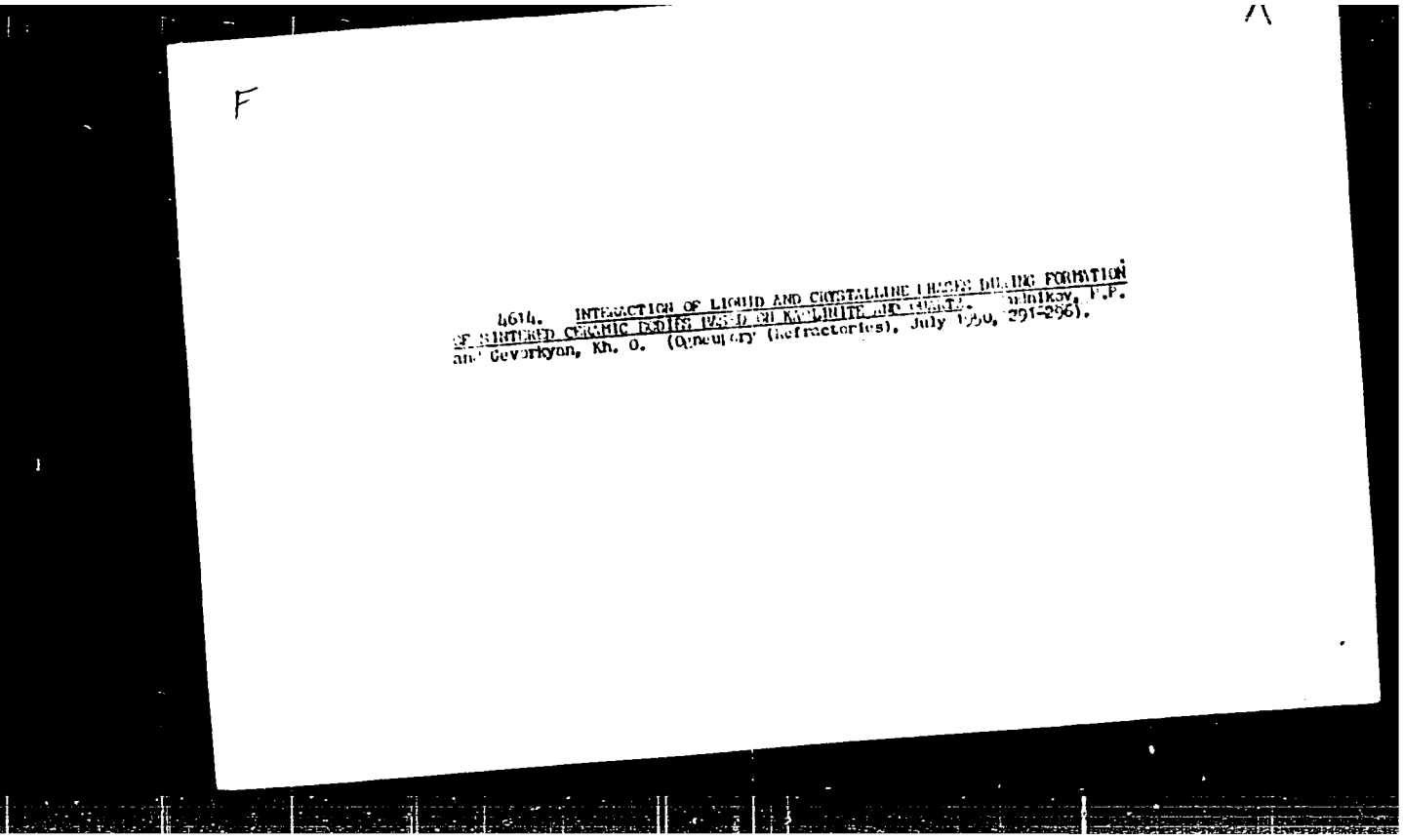
Part Two: Refractory Materials

Tekhnologiya keramiki i ogneuporov

Tekhnologiya keramiki i ogneuporov

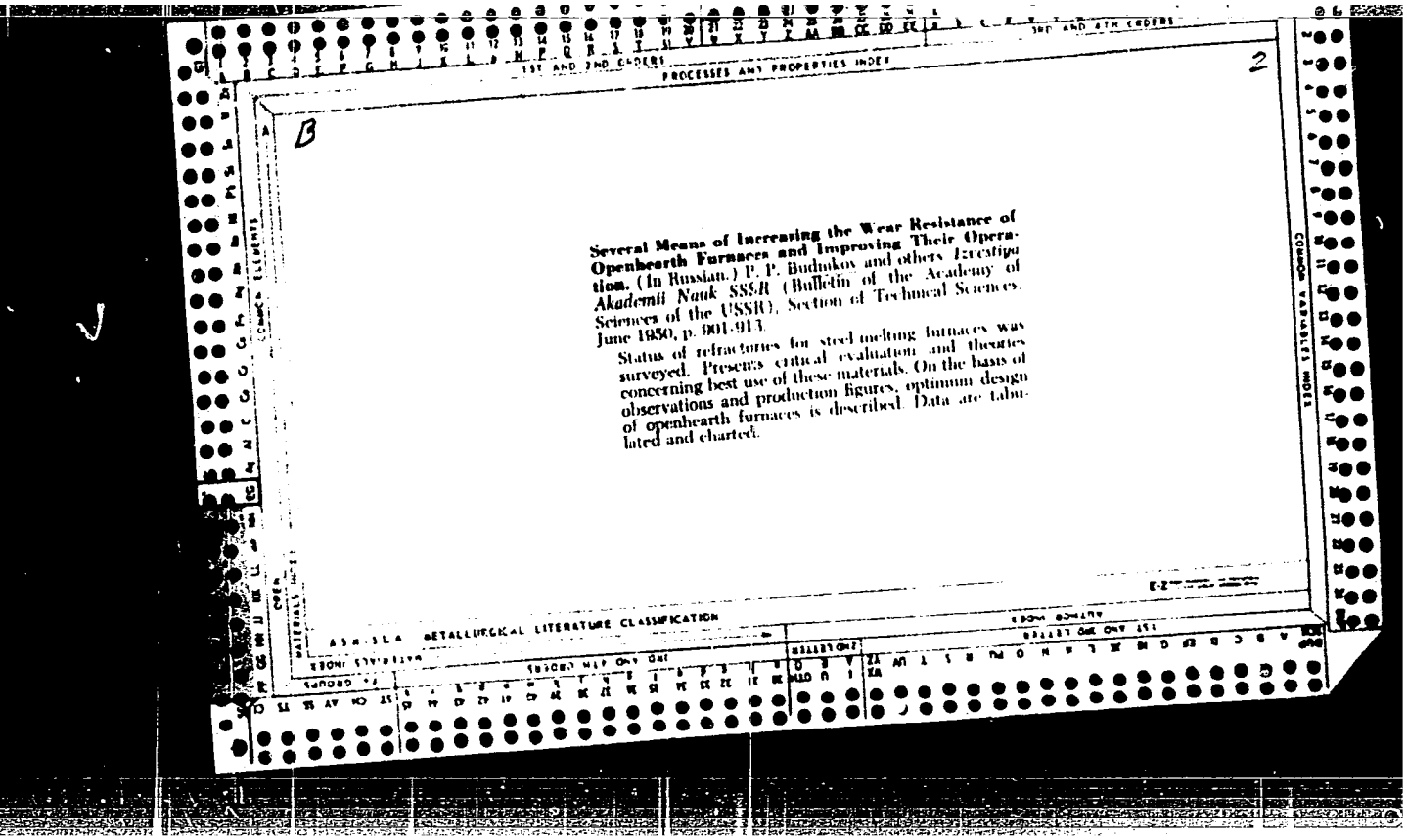
No. of References: 73 Russian reference sources (1927-1949) and one Czech 1948 source are listed at the end of the book.

Facilities: Several names of scientists are mentioned in the text and listed in the references.



F

4614. INTERACTION OF LIQUID AND CRYSTALLINE PHASES DURING FORMATION OF SINTERED CERAMIC BODIES BASED ON KAOLINITE AND TALC. Mnatsakanov, T.P. and Gevorkyan, Kh. O. (Ogneupory (Refractories), July 1960, 291-296).



Several Means of Increasing the Wear Resistance of Openhearth Furnaces and Improving Their Operation. (In Russian.) P. P. Budnikov and others *Izvestiya Akademii Nauk SSSR* (Bulletin of the Academy of Sciences of the USSR), Section of Technical Sciences, June 1950, p. 901-913.

Status of refractories for steel melting furnaces was surveyed. Presents critical evaluation and theories concerning best use of these materials. On the basis of observations and production figures, optimum design of openhearth furnaces is described. Data are tabulated and charted.

BUDNIKOV, P.P.

Recrystallization of magnesium oxide and its chemical reactivity. Dopovidi Akad. Nauk Ukr. R.S.R. '50, No.5, 339-43. (MLRA 6:4)
(CA 47 no.22:11926 '53)

1. D.I.Mendeleyev Inst. Chem. Technol., Moscow

BUDNIKOV, P. P.

CATALYSTS 2

(3) Chem

Reaction of chromium oxide with forsterite in the solid phase. P. P. Budnikov (D. I. Mendeleev Inst. Chem. Technol., Moscow) and K. S. Berezhnoi. *Doporidi Akad. Nauk Ukr. R.S.R.* 1950, No. 5, 345–8 (Russian summary, 348–9).—Mixts. of Cr_2O_3 and Mg_2SiO_4 were pressed at 500 kg./sq. cm. and the specimens kept 0.5–7.0 hrs. at 1200°, as well as in the range 1000–1600° with temp. rise over 2 hrs. After cooling in air, the extent of conversion to $MgSiO_3$ and $MgCr_2O_4$ was detd. by soln. in 15% HCl at 80° for 20 min., under which conditions only forsterite is attacked; both photographic and x-ray methods were used. At 1200° the reaction is intensive for 2 hrs., then almost stops, owing to coating effects with reduced diffusion. At higher temp. the reaction is more rapid; at 1300° partial vitrification occurs. The reaction runs to completion at 1850–1900° with 3.6% vol. increase. The resulting mixt. of 66% $MgCr_2O_4$ and 34% $MgSiO_3$ is refractory above 1900°. G. M. K.

9-2-54 gpp

(CA 47 no. 21: 11064 '53)

168T52

USSR/Metals - Steel Making, Equipment Jun 50

"Some Measures for Increasing the Endurance of Open-Hearth Furnaces and Improving Their Utilization," P. P. Budinikov, Corr Mem Acad Sci USSR, D. P. Bogatskiy, A. A. Lebed'kov, Ya. L. Rozenblit

"Iz Ak Nauk SSSR, Otdel Tekh Nauk" No 6, pp 901-913

Reviews recent problems of high-refractory materials for steel-making furnaces, with substantiated suggestions on applying these materials.

[redacted] 168T52

USSR/Metals - Steel Making, Equipment Jun 50
(Contd)

Confirms expediency of constructing suspended basic roofs in open-hearth furnaces. Suggests solutions to problems of producing [redacted]-refractory materials. Submitted 3 Feb 50.

[redacted] 168T52

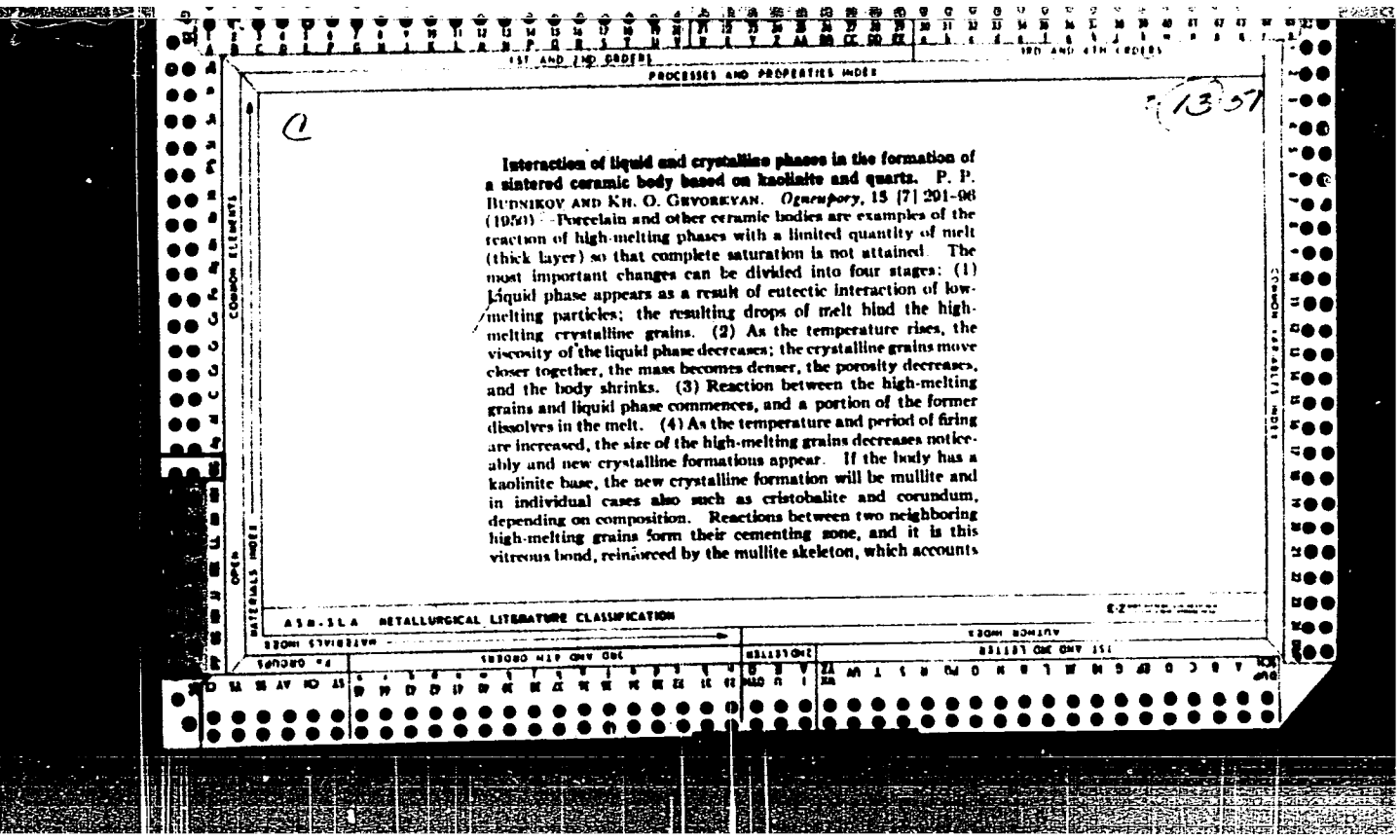
BUDINIKOV, P. P.

APPROVED FOR RELEASE: 06/09/2000 CIA-RDP86-00513R000307310004-3"

BCS

Russia Porcelain
Pottery

1975. The investigations of V. I. Vernadsky on the structure of porcelain.—P. P. Budnikov and Ke. O. Gevorkyan (Steklo. Keram., 7, No. 8, 4, 1950). In a brief article on distinguishing mullite from sillimanite the authors are mainly concerned with the priority for such differentiation, which they claim for a Russian scientist, V. I. Vernadsky, who is stated to have proved in 1899 that the acicular crystals in porcelain are not sillimanite. He is also stated to have determined the chem. comp. of these crystals much earlier than did Bowen and Greig (1924).



PROCESSES AND PROPERTIES INDEX

1337

C

Interaction of liquid and crystalline phases in the formation of a sintered ceramic body based on kaolinite and quarts. P. P. BUDNIKOV AND KH. O. GEVORKYAN. *Ogneupory*, 15 [7] 291-98 (1950).—Porcelain and other ceramic bodies are examples of the reaction of high-melting phases with a limited quantity of melt (thick layer) so that complete saturation is not attained. The most important changes can be divided into four stages: (1) Liquid phase appears as a result of eutectic interaction of low-melting particles; the resulting drops of melt bind the high-melting crystalline grains. (2) As the temperature rises, the viscosity of the liquid phase decreases; the crystalline grains move closer together, the mass becomes denser, the porosity decreases, and the body shrinks. (3) Reaction between the high-melting grains and liquid phase commences, and a portion of the former dissolves in the melt. (4) As the temperature and period of firing are increased, the size of the high-melting grains decreases noticeably and new crystalline formations appear. If the body has a kaolinite base, the new crystalline formation will be mullite and in individual cases also such as cristobalite and corundum, depending on composition. Reactions between two neighboring high-melting grains form their cementing zone, and it is this vitreous bond, reinforced by the mullite skeleton, which accounts

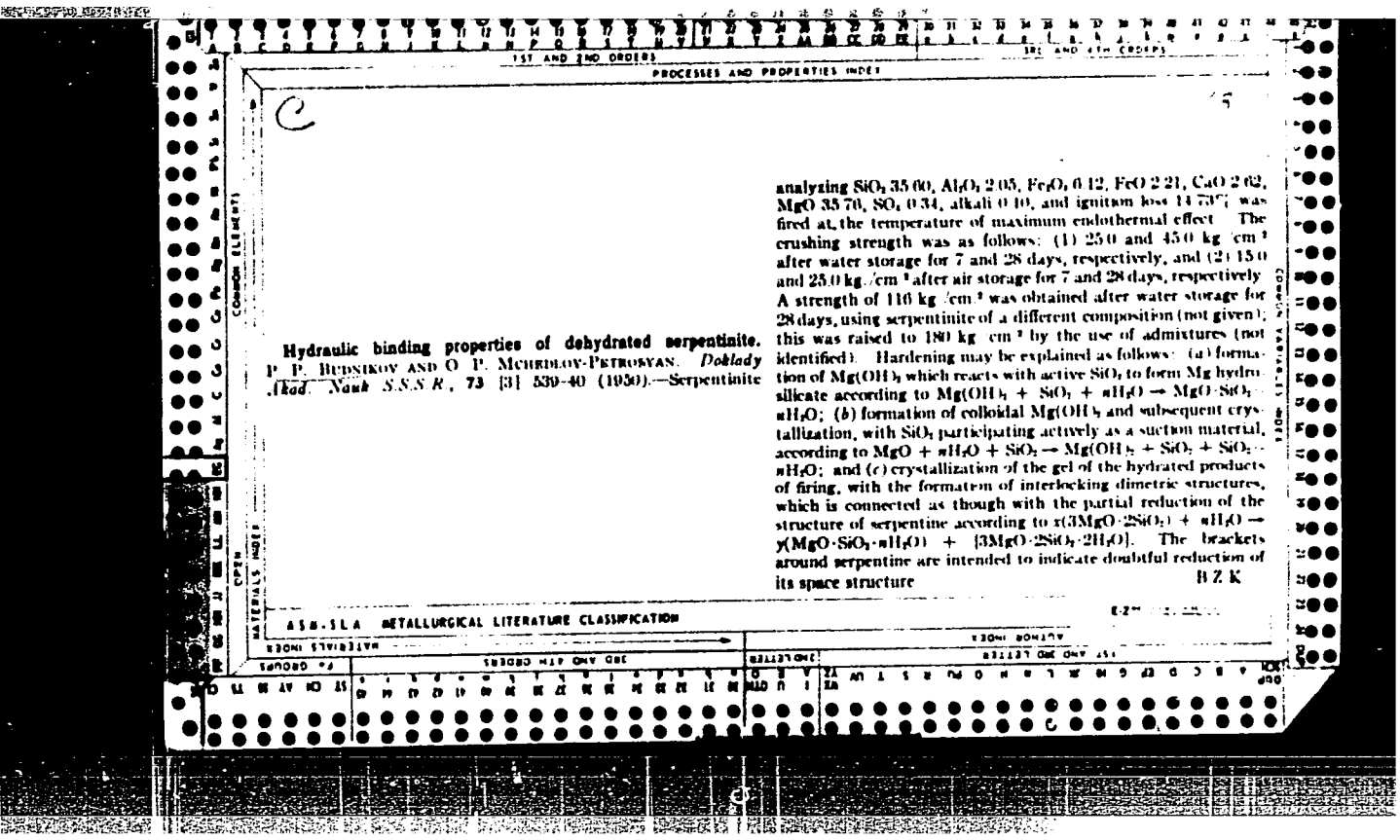
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

for the high mechanical properties of the body. The degree of vitrification will depend on the desired physicomechanical characteristics and can be judged by the coefficient of "aging" (K) in $K = \Delta V/V = 1.33\pi(r_1^3 - r_2^3)/1.33\pi r_1^3 = (r_1^3 - r_2^3)/r_1^3$, where V = initial volume of the grain (spherical form), ΔV = volume of fused portion of grain (spherical layer), and r_1 and r_2 = grain radii before and after fusion. The kinetics of phase interaction can be judged by "average rate of fusion" (K_1) in $K_1 = K/t$, where t is the time required to fuse over the grain to given size. 8 diagrams.

B Z K

CA

Effect of magnetic field on the solid-phase reaction in the system lime-silica. P. P. Budnikov, O. P. Mchedlov-Petrosyan, and S. E. Shou-Shakhbudagyan. *Doklady Akad. Nauk S.S.S.R.* 70, 285-6(1950).—One-g. samples of 1:1 stoichiometric mixts. of CaO and quartz were heated, without and in a field of 10,000 gausses, to temps. ranging from 300 to 1000° in 15 min., held at this desired temp. for 2 hrs., cooled rapidly in a desiccator, and free CaO was detd. by the ethylene glycol method. With rising temp., the effect of the magnetic field on the solid-phase reaction increases. The change in the curve of reacted CaO *vs.* temp. was sharper with than without the magnetic field. At temps. above 800°, the effect of the field increases. At high temps. it may have an orienting effect and may facilitate the formation of crystn. centers of the new phase.
B. Z. Kamich



Hydraulic binding properties of dehydrated serpentinite. P. P. Budnikov and O. P. Mchedlov-Petrosyan. *Doklady Akad. Nauk S.S.S.R.*, **73** [3] 539–40 (1950).—Serpentinite analyzing SiO_2 35.00, Al_2O_3 2.05, Fe_2O_3 0.12, FeO 2.21, CaO 2.62, MgO 35.70, SO_3 0.34, alkali 0.10, and ignition loss 14.75%, was fired at the temperature of maximum endothermal effect. The crushing strength was as follows: (1) 25.0 and 45.0 kg./cm.^{2} after water storage for 7 and 28 days, respectively, and (2) 15.0 and 25.0 kg./cm.^{2} after air storage for 7 and 28 days, respectively. A strength of 110 kg./cm.^{2} was obtained after water storage for 28 days, using serpentinite of a different composition (not given); this was raised to 180 kg./cm.^{2} by the use of admixtures (not identified). Hardening may be explained as follows: (*a*) formation of $Mg(OH)_2$ which reacts with active SiO_2 to form Mg hydrosilicate according to $Mg(OH)_2 + SiO_2 + nH_2O \rightarrow MgO{\cdot}SiO_2{\cdot}nH_2O$; (*b*) formation of colloidal $Mg(OH)_2$ and subsequent crystallization, with SiO_2 participating actively as a suction material, according to $MgO + nH_2O + SiO_2 \rightarrow Mg(OH)_2 + SiO_2 + SiO_2{\cdot}nH_2O$; and (*c*) crystallization of the gel of the hydrated products of firing, with the formation of interlocking dimetric structures, which is connected as though with the partial reduction of the structure of serpentine according to $x(3MgO{\cdot}2SiO_2) + nH_2O \rightarrow y(MgO{\cdot}SiO_2{\cdot}nH_2O) + [3MgO{\cdot}2SiO_2{\cdot}2H_2O]$. The brackets around serpentine are intended to indicate doubtful reduction of its space structure. B Z K

F. P. BUDNIKOV

Some properties of clinkerless slag cement. F. P. Budnikov and V. K. Glazov. *Doklady Akad. Nauk S.S.S.R.*, 73, 1009-11(1950). Cements were made from slags of compn. SiO_2 37.02 and 38.36, Al_2O_3 7.08 and 8.37, CaO 49.69 and 44.50, MgO 3.35 and 2.37, FeO 0.35 and 0.32, MnO 0.91 and 4.25, and S 2.51 and 2.50%. Transition coeffs. (ratio of plastic consistency to rigid) were 0.81-1.17 after 7 days and 0.83-0.97 after 28 days upon stretching and 0.40-0.96 after 7 days and 0.57-0.81 after 28 days upon compressing. The much lower transition coeff. of this cement, compared with slag portland cement, indicates greater activity of the former in solns. of plastic consistency; this may be explained by combination, during hardening, of much H_2O with the Ca hydro sulfoaluminate. Heat liberated by the cement during hydration was only 15-26 cal./g. in 7 days. High stability of the cement in hydraulic works is due to insignificant sepn. of lime during hardening and to higher stability of products of hydration compared with those of portland cement. The possibility of gypsum formation in concrete of this cement is limited because of the low content of CaO so that it is more stable than portland cement in Na_2SO_4 solns. In making this cement, care must be taken to prevent increase of CaO in the liquid phase to 1.08 g./l. or higher; such concns. result in formation of $4CaO.Al_2O_3.12H_2O$, which reacts with $CaSO_4$ to form destructive Ca hydrosulfoaluminate. Similarly, this cement should not be mixed with lime, portland cement, or slag portland cement.

B. Z. Kamich

CA

No. 5

Synthesis of phenakite P. P. Budnikov and A. M. Cherepanov *Doklady Akad. Nauk S.S.S.R.* **74**, 1011-14 (1950). In the system BeO-SiO_2, only the orthosilicate, phenakite, is stable, not the compd. $BeSiO_3$. The phenakite synthesis is possible under the action of strong mineralizers, and by isomorphous nucleation, e.g., with Zn_2SiO_4 (Morgan and Hummel, C.A. **43**, 8114e). B and C observed that Mn_3O_4(MnO) is an important catalyst for the formation of phenakite from the oxides, but $2CaO.SiO_2$ and $2CdO.SiO_2$ are inactive. The expts. were done in a kryptol furnace, in an oxidizing atm. at 1400, 1500, 1600° for 2.5, 1.5, 0.5 hrs. BeO (bromellite) is observed in hexagonal isometric grains with n_o = 1.718, n_e = 1.732; cristobalite in scaly aggregates, isotropic, with n = 1.487. phenakite was first observed in MnO_2-contg. batches fired at 1500°. The crystals have abundant glass inclusions of yellowish color; the habit is prismatic, n_o = 1.650, n_e = 1.667 (grains are 20 × 40μ). At 1600° the phenakite is completely decompd. to BeO and glass, the dissocn. temp. is estd. to be 1560°. The thermal analysis curve for the reaction in the solid state of $2BeO + SiO_2$ (with 2% MnO) shows an exothermic effect at 1300° which indicates the beginning of formation of phenakite. W. Eitel

AYZENBERG, Yu.B.; BUDNIKOV, P.P., redaktor; MASHRYKOV, K., otvetstvennyy redaktor; ZUBOVA, N.I., tekhnicheskiy redaktor

[Turkmenistan building materials; raw material sources and technological investigations] Stroitel'nye materialy Turkmenistana; syr'evye istochniki i tekhnologicheskaia izuchennost'. Pod obshchei red. P.P.Budnikova. Ovt.red. K.Mashrykov. Ashkhabad, Izd-vo Akademii nauk Turkmenskoi SSR, 1951. 226 p. [Microfilm] (MLRA 10:3)

1. Chlen-korrespondent AN SSSR, deystvitel'nyy chlen AN USSR (for Ayzenberg)
(Turkmenistan--Building materials)

BUDNIKOV, P. P.

"Chemistry of Silicates on the Job of Great Constructions of Communism," Moscow, 1951-52.

BUDNIKOV, P. P.

7 r'

The method of intensification of the production of silicate building goods. P. P. Budnikov, M. A. Matveev, and S. I. Yurchik. *Doprovid Akad. Nauk Ukr. R.S.R.* 1951, 408–12(Russian summary, 412–13); cf. *C.A.* 48, 3657g.—The intensification consists in the following: to the standard mixt. of lime with sand or clay were added 3–5% granulated Na_2SiO_3 or 10% of tripoli moistening with 3–5% of $CaCl_2$ soln. Then formed bricks were exposed to the hydrothermal treatment during 4 hrs. at 2–4 atm. pressure.

M. Charmandarian

HT

(2)

B.A.R

Ceramics

5956* **High Quality Structural Materials—The Great Buildings of Communism.** (In Russian.) P. P. Budnikov. *Izvestiia Akademii Nauk SSSR*, Section of Technical Sciences, May, 1951, p. 644-651.

A discussion of developments and improvements in concrete and concrete structures.

MATVIYEYEV, M.A.; YURCHYK, S.I.; BUDNYKOV, P.P., diysnyy chlen.

The problem of manufacturing silicate construction materials from sand and quicklime. Dop.AN URSR no.4:253-258 '51. (MLRA 6:9)

1. Akademiya nauk Ukrayins'koyi RSR (for Budnykov).
(Silicates) (Building materials)

BUDNIKOV, PP.

Conclusions of porcelain structure in the investigations of
Vestnik Akad. P. P. Budnikov and Kh. O. Gevorkyan.
Nauk SSSR, No. 3, 70-71(1951). Chem. Zentr., 1951, II,
M. G. Moore
A theoretical review.

USSR
GERM.

BUDNIKOV, P. P.

USSR/Engineering - Construction, Materials — Jun 51

"Brine as Source of Raw Materials for Manufacturing Magnesia Cement and High-Refractory Products," P. P. Budnikov, Corr Mem, Acad Sci USSR, A. A. Alent'yev

"Iz Ak Nauk SSSR, Otdel Tekh Nauk" No 6, pp 883-886

Discusses possibility of obtaining magnesium hydroxide out of brine from sea waters of Crimea. Explains application of material, mixed with $Mg\ Cl_2$, for making magnesia cement and construction products based on this cement. Outlines

205T10

USSR/Engineering - Construction, Materials (Contd) — Jun 51

process for manufg magnesite and fosterite refactory products. Some of them had properties: heat resistance 1,810 - 1,820°, compression strength 240 – 390 kg/sq cm, beginning of deformation under 2 kg/sq cm at 1,570 - 1,580°.

205T10

C. A.
1951

Kiev, Clay Products, Refractories and Enameled Metals

19

Diffusion period in firing of porcelain. P. P. Budnikov and Kh. O. Gevorkyan. *Steklo i Keram.* 8, No. 3, 16-17 (1951).—A porcelain body consists of "microcomponents." Within each "microcomponent" there is a definite concn. difference which dets. the course of the diffusion processes in accordance with $dS = D.F.\frac{dc}{dx}.ds$, where dS is the amt. of substance diffusing through cross section F in the time ds, dc/dx is change in concn. for distance dx, and D is coeff. of diffusion. During the high-temp. holding period, the conditions for diffusion are most favorable but diffusion occurs also during other stages of the firing. Diffusion proceeds within each "microcomponent" at the contact of the liquid and cryst. phases. The most important diffusion processes occur at the points of contact of quartz and feldspar melt; kaolinite and feldspar melt, and within the liquid phase; the last type is the result of nonhomogeneity of the liquid phase within the limits of each "microcomponent." Diffusion causes more uniform distribution of the cryst. substance within the liquid, the result being a stable skeleton of mullite crystals and undissolved quartz grains and having valuable tech. properties. Effects of quartz grains are deemed beneficial since firing above certain temps. causes soln. of the quartz grains in the feldspar melt with resultant deterioration of the characteristics. Diffusion, not mullitization and vitrification, is the final process. Diffusion does not proceed to completion since this would require high temps. at which the body would undergo deformation. H. L. K.

CA

20

Effect of calcium sulfate on the process of hydration of the calcium aluminates $CaO.Al_2O_3$ and $5CaO.3Al_2O_3$. P. P. Budnikov and I. V. Kravchenko. *Kolloid. Zhur.* 13, 408-11(1951).—Action of H_2O on $CaO.Al_2O_3$ (I) and $5CaO.3Al_2O_3$ (II), both made by melting together Al_2O_3 and $CaCO_3$, results at 20° in formation of $2CaO.Al_2O_3.7H_2O$ (III) and at 70° in formation of $3CaO.Al_2O_3.6H_2O$ (IV). III forms spherolites, which cause great strength of the cement, whereas IV forms sep. crystals in a matrix of $Al(OH)_3$ gel and thus gives rise to weak cement. The strength of cement setting at high temp. is improved by addn. of $CaSO_4$, which induces formation of $3CaO.Al_2O_3.3CaSO_4.31H_2O$(V) and $3CaO.Al_2O_3.CaSO_4.12H_2O$ (VI). I and II in H_2O give also small amts. of $CaO.Al_2O_3.10H_2O$ (VII) and $3CaO.Al_2O_3.12H_2O$ (VIII), resp. The ns of these hydrates are: IV 1.605, V 1.466 and 1.460, VI 1.504 and 1.489, VII 1.480, and VIII 1.528 and 1.525. When 3 parts gypsum was shaken with 7 parts I, II, or cement (contg. 55% I), and a large amt. of H_2O, and CaO, Al_2O_3 and SO_3 were detd. in the filtrate from time to time, it was found that the main amt. of gypsum was bound by II within 1 hr., by I within 3 days, and by cement within 7 days. J. J. Bikerman

BUDNIKOV, P. P.

Chemical Abst.
Vol. 48 No. 6
Mar. 25, 1954
Cement, Concrete, and
Other Building Materials

Relation between the physicochemical properties of pozzolanic substances and the strength of pozzolanic portland cement. P. P. Budnikov (Moscow Chem.-Technol. Inst.). *Ukrain. Khim. Zhur.* 17, 451-62(1951)(in Russian).--The activity of different pozzolanic substances was detd. by a calorimetric method. Results agreed with data on strength of cement, the more heat liberated by reaction of pozzolanic addn. with $Ca(OH)_2$, the greater the resistance of the cement against fracture. Tripoli from different deposits in the Ukraine can be used as admixt. to portland cement in hydraulic constructions. B. Z. Kamich

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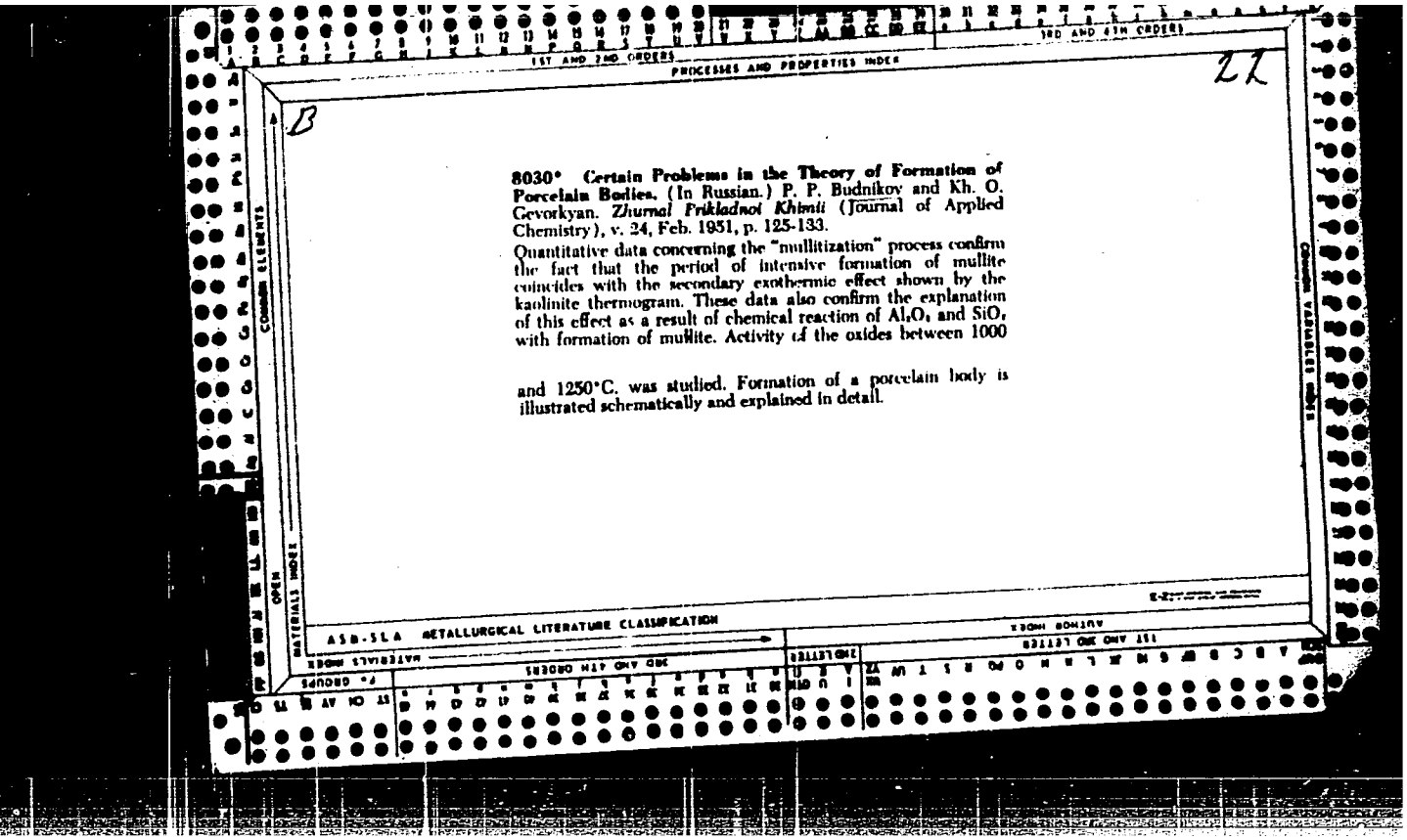

8030* **Certain Problems in the Theory of Formation of Porcelain Bodies.** (In Russian.) P. P. Budnikov and Kh. O. Gevorkyan. *Zhurnal Prikladnoi Khimii* (Journal of Applied Chemistry), v. 24, Feb. 1951, p. 125-133.

Quantitative data concerning the "mullitization" process confirm the fact that the period of intensive formation of mullite coincides with the secondary exothermic effect shown by the kaolinite thermogram. These data also confirm the explanation of this effect as a result of chemical reaction of Al_2O_3 and SiO_2 with formation of mullite. Activity of the oxides between 1000 and 1250°C. was studied. Formation of a porcelain body is illustrated schematically and explained in detail.

CA

19

Theory of the formation of a porcelain body. P. P. Budnikov and Kh. O. Gevorkyan. *J. Applied Chem. U.S.S.R.* **24**, 141-9(1951)(Engl. translation); cf. *C. A.* **45**, 1713h, 9238d. -The process of mullitization coincides with the 2nd exothermal effect in the heating curve of kaolinite. This also coincides with the chem. reaction of Al_2O_3 and SiO_2 to form mullite. Above 1000° (after the first exothermal effect) and up to 1250°, the Al_2O_3 and SiO_2 are in an active state which helps mullitization. The vitreous phase comprises feldspar glass, silica-feldspar glass without mullite enveloping the quartz grains, and silica-feldspar glass contg. mullite within the confines of the particles of the kaolinite residue.

A. George Stern

PA 193T30

USSR/Chemistry - Refractories Sep 51

Review of P. L. Pevzner's 'Termitovyye Ogneupory' (Thermite Refractories)," P. P. Budnikov

"Zhur Prik Khim" Vol XXIV, No 9, pp 999, 1000

Book reviewed describes new USSR "thermite method" for production of corundum refractories, which are superior to electrically melted mullite refractories whose production was started at Yerevan factory in last 10 yrs. In thermite process, which is based on property of Al to reduce many oxides, a charge, made up of separately prepd components, is melted in a melting

193T30

USSR/Chemistry - Refractories (Contd) Sep 51

ladle (2-3 min), poured into forms, and subjected to heat treatment, yielding the finished product. Process is economical of fuel and electricity. Thermite corundum refractories are 4 times more durable than electrically melted mullite refractories. Book published by Promstroyizdat, 1951, 58 pp, price 2.30 r.

193T30

BUDNIKOV, P. P.

CA

20

Great achievements of the Stalin epoch and the building materials for it. P. P. Budnikov. *Vest. Prikład. Khim.* 24, 1109-21(1951).—In the 2nd half of 1950, the USSR government authorized the construction of hydroelectric stations on the Volga and on the Dnieper, a canal joining Amou Darja to Krasnovodsk on the Caspian Sea, and South Ukrainian and North Crimean canals. An irrigation program connected with the canals will bring 14 millions hectares into production. The Ukrainian hydroelec. project and canal will permit irrigation of 3.2 million hectares in South Ukraine and north Crimea. In connection with these projects, plants will be built to produce various construction materials, particularly cement. Material resources found in the Ukraine are described. These will provide different types of cement that will be needed for construction of dams, buildings, for thermal insulation, and for elec. isolation. S. Steržod

BUDNIKOV, P. P.

USSR/Chemistry - Plaster of Paris Dec 51
Building Materials

"Review of M. A. Matveyev and K. M. Tkachenko's 'Water Resistance of Plaster-of-Paris Construction Components and How to Increase It,'" P. P. Budnikov

"Zhur Prik Khim" Vol XXV, No 12, pp 1325, 1326

Book covers different means for waterproofing plaster of Paris. Impregnation or sealing with urea resins is recommended for casting architectural details or prepn of pressed facing slabs. Plaster-lime and plaster-lime-puzzolan mixts are suitable for prepn of cast or vibrated blocks and other external building parts. Plaster parts of

206T35

USSR/Chemistry - Plaster of Paris (Contd) Dec 51

this type may then be painted on one side with a zinc-silicate coating or sprayed with a urea resin soln to create an addnl external waterproof layer if necessary. Published by Promstroyizdat, Moscow, 1951, 92 pp, price 4.102.

206T35

USSR/Engineering - Cements, Technology 11 Aug 51

"Activation of the Setting Process in Slag Cements," P. P. Budnikov, Corr Mem, Acad Sci USSR, V. N. Yung, Yu. M. Butt

"Dok Ak Nauk SSSR" Vol LXXIX, No 5, pp 851-854

Presents theoretical and exptl data corroborating possibility of intensifying hydration and setting process in slag cements by introduction of alk and sulfate agents promoting solidification, pulverization of slag in the presence of water, hydrothermal treatment of setting cements with subsequent

210T43

USSR/Engineering - Cements, Technology (Contd) 11 Aug 51

heating. Methods permit converting blast-furnace slags into high-quality binders capable of replacing Portland cement in many cases.

210T43

BUDNIKOV, P. P.

BUDNIKOV, P. P.

USSR/Engineering - Refractories, Technology — Nov 51

"Effect of Steam Pressure on Physicomechanical Properties of Silica Brick With Addition of Granulated Sodium Silicate," P. P. Budnikov, Corr Mem, Acad Sci USSR, M. A. Matveyev, S. I. Yurchik

"Dok Ak Nauk SSSR" Vol LXXXI, No 2, pp 255-258

Introduction of sodium silicate into sand-lime mixt intensifies formation of calcium hydrosilicates due to increased content of active silica, and increases effect of higher steam pressure in autoclave in respect to improving strength of

199T31

USSR/Engineering - Refractories, Technology (Contd) — Nov 51

product made by hydrothermal method. In addn, granulated sodium silicate decreases water absorption of brick, having favorable effect on its frost-resistance.

199T31

ACS

Mechanism of formation of cordierite and its stability. P. P. Budnikov, V. G. Avetikov, and A. A. Zvyagil'skii. *Doklady Akad. Nauk S.S.S.R.*, 81 [5] 883–86 (1951).—A charge consisting of 3 moles talc, 2 moles fire clay, and 3 moles alumina was wet ground in a ball mill to 60–100μ, and the slip was dehydrated, dried, and fired at 1350°C. The fired product showed no sign of destruction after 25 heat-shock cycles (800°→ cold water). X-ray and petrographic analyses showed that the accompanying crystalline products were clinoenstatite, mullite, and spinel.

B.Z.K.

BUDNIKOV, PETR PETROVICH

Technology

(Chemistry of silicate in the great communist construction projects) Moskva (Znanie) 1952.

9. Monthly List of Russian Accessions, Library of Congress, July 1952. Unclassified.

BUDNIKOV, P. P.

"Some Measures for increasing the endurance of open-hearth furnaces and improving their utilization," 1952.

U-1884, 29 April 52

1. BUDNIKOV, P.P., NEKRICH, M.I., PAPKOVA, L.P.

2. USSR (600)

4. Slag cement

7. Akaline slag as slurry fluidizer. Tsement No. 2, 1952. Akad.

9. Monthly List of Russian Accessions, Library of Congress August 1952, UNCLASSIFIED.

U S S R

The influence of hydrophilic surface-active additions upon the hardening (setting) of the β-hemihydrate of gypsum. P. P. Budnikov. *Doklady Akad. Nauk Ukr. S.S.R.* 1952, [illegible] 189–91 (Russian summary, 191–2).—The influence of the vinasse (I) from the sulfite-EtOH industry upon the setting of the β-hemihydrate (II) of gypsum and upon the anhydrite (III) prepd. from $CaSO_4.2H_2O$ was investigated because it is a common practice in the Ukraine to add 0.1–0.25% I to the water used for the setting of portland cement. The gypsum used for prepg. III contained CaO 32.61, SO_3 46.22, R_2O_3 0.04, insol. matter 0.65, and H_2O 21.01%; the I was added to the H_2O employed in amts. of 0.1, 0.2, 0.5, 1.0, and 2.0% of the wt. of the II or III. I had a profound influence upon the crystn.; the crystals became smaller, much more numerous, but did not change their habit. The endurance strength also changed greatly, thus, e.g., after 1 day, 7 days, and at the time when a const. wt. was reached this strength was for II 65, 86, and 137, for III 65, 86, 137, for II with addn. of 2% I 118, 136, and 209, and for III with addn. of 2% I 115, 121, and 231 kg./sq. cm., resp. The setting time also changed; it started and ended for II alone at 4 and 8, for III alone at 4 and 8, for II with 2% I at 12 and 21, and for III with 2% I at 11 and 22 min., resp. Thus, as far as gypsum alone is concerned, such addn. of I is indeed desirable.

Werner Jacobson

BUDNIKOV, P.

Nov 52

USSR/Metallurgy - Slags, Utilization

"The Complex Utilization of Blast-Furnace Slags," P. Budnikov, Mem Acad Corr Sci USSR, Stalin Prize Laureate

Za Ekon Materialov, No 4, pp 59-65

In discussing use of blast-furnace slags for manufacture of various structural materials, pays special attention to hydraulic clinkerless cement, otherwise known as sulfate-slag cement. Method for its production consists of joint milling of granulated slag with 5-10% anhydrite (gypsum, burnt at 600-700°, or native anhydrite) and 5-8% of dolomite, burnt at 800-900° for use with basic slag and at 1,000-1,100° in case of acid slag. States that this cement, which is less expensive than portland or possuolana cements, is considerably more resistive to action of sea water and mineralized waters particularly rich in sulfates.

Source #264T59

BUDNIKOV, P. P.

USSR/Engineering - Refractories, Equipment May 52

"Application of the Electron Microscope in Studying Mullite Clinker," P.P. Budnikov, Act Mem, Acad Sci Ukrainian SSR, V.S. Fadeyeva, Cand Tech Sci, Moscow Chem-Technol Inst imeni D.I.Mendeleyev

"Ogneupory" No 5, pp 228-230

Briefly describe l method for examn of sintered mullite clinkers under electron microscope, including procedure of prepg replicas.

[illegible]40

BUDNIKOV, P.P.; GEVORKYAN, Kh.O.

The role of feldspar in the formation of the structure of porcelain. Steklo i Keram. 9, No.3, 19-20 '52. (MLRA 5:2)
(CA 47 no.19:10192 '53)

MATVYEYEV, M.O.; BUDNYKOV, P.P., diysnyy chlen.

Problem of controlling the quality of silicate brick. Dop.AN URSR no.4:279-283 '52. (MLRA 6:10)

1. Akademiya nauk Ukrayins'koyi RSR (for Budnykov). 2. Khimiko-tekhnologichnyy instytut im. D.I.Mendelyeyeva (for Matvyeyev). (Bricks)

BUDNIKOV, P. P., STOL'NIKOV, V. V., Dr. of Tech. Sci.

Building Materials

High quality constructions material for the great construction projects of communism. Vest. AN ASSR 22 No. 7, 1952.

Monthly List of Russian Accessions, Library of Congress, November 1952. Unclassified.

BUDNIKOV, P. P. Dec 52

USSR/Engineering - Petrography

"Review of 'Petrography of Technical Stone,'" (reviewed by P. P. Budnikov)

Ogneupory, No. 12, pp 568-571

"Review of Petrografiya Tekhnicheskogo Kamnya," by Acad D. S. Belyankin, B. V, Ivanav, and V. V. Lapin, published by Acad Sci USSR, 1952, 583 pp. According to reviewer, book is first work on problems of technical petrography. States this independent branch of petrographic science was created by Soviet scientists in answer to requirements of industry. Book is purposely limited to information on major and well studied varieties of tech stone--refractories, ceramic products, slags, nonmetallic inclusions in steel, binders, and components of industrial glass. Other types, such as abrasives, glazes, enamels, and silicate and red bricks, will be included, acc to authors' intention, in next edition. Based mainly on original investigations by authors, book shows general

(over)

267T69

BUDNIKOV, P.P.; FADEYEVA, V.S.

Use of the electron microscope in investigating mullite bodies. Ogneupory 17, 228-30 '52.
(CA 47 no.21:11685 '53)

1. Moscow D.I. Mendeleyev Inst. Chem.-Technol., Moscow.

HUDNIKOV, P. P., KOSYREVA, Z. S.

Portland Cement

Expanding portland cement without the formation of hydrosulfaluminate. TSement 18 No. 4, 1952.

9. Monthly List of Russian Accessions, Library of Congress, December 1952, Uncl.

Properties of vacuum-treated clay. P. P. Budnikov and I. A. Perovich. *J. Appl. Chem. U.S.S.R.* 25, 267-79(1952); *Zhur. Priklad. Khim.* 25, 244-56(1952)(Engl. translation).— The effects of pressure and air content on the plasticity of montmorillonite clays were investigated. The air-dried clay was sieved, moistened to normal plastic consistency, and then passed into a vacuum press to form a thin ribbon. The vacuum-treated band was kept under neutral machine oil to prevent moisture evapn.; the oil did not penetrate deeply into the clay. The air vol. in the clay was detd. in the Spurrier app., which is based on the sepn. of air by vacuum after dispersing the material in water. The plasticity was detd. by the method of Zemyatchenskii (cf. *C.A.* 25, 6527). In a graph the increase in plasticity with increasing vacuum treatment was shown for Beskudnikov I, Kuchin II, and Ashkhabad III clays. The thixotropy of I and II remained const. after 72 hrs. and that of III after 48 hrs. The moisture output and setting were measured, and the drying rate was plotted against moisture. The linear shrinkage was detd. with an accuracy of 0.005 mm. Deep vacuum treatment (700 mm. Hg) decreased the drying rate and the linear shrinkage. It was assumed that the surface of plastic clays is made hydrophobic by the adsorption of fine air bubbles by the solid. This air cushion affects the physio-chem. properties. The first crit. point on the drying-rate curve is attained when the surface humidity becomes equal to the hygroscopic humidity. The 2nd crit. point corresponds to the stage where the surface humidity attains the level of the moisture bound by adsorption. After deep vacuum treatment of I and II, the 1st and 2nd crit. points are shifted towards higher humidity; for III, with a low absorption capacity, there is little or no change in the position of the crit. points. The increase in the plasticity of clays after the vacuum treatment is caused by changes in the capillary structure in such a way that occluded air passes extremely slowly. The decrease of the coeff. of linear shrinkage is connected with the increase of adsorbed water at the expense of capillary-bound water. F. Schossberger

NOS.

1. P. P. BUDNIKOV, N. S. STROYLATSKIY
2. USSR (600)
4. Civil Engineering
7. Some problems in civil engineering. Vest. AN SSSR 22 no. 11. 1952.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

BUDNIKOV, P. P.

USSR/Chemistry, Chemical Engineering - Heat Transfer Jun 52

"Investigation of the Heat Conductivity and Temperature Conductivity of Vacuum-Treated Clays," P. P. Budnikov, I. A. Al'perovich

"Zhur Prik Khim" Vol XXV, No 6, pp 582-591

Thermal cond determines the intensity of heat transfer from the surface to the center of particles of the material, temp cond (rate of transfer of temp changes) the behavior of the object in a nonstationary thermal regime. The heat cond coeff of Beskudnikovo and Kuchinsk clay is inversely proportional

218T29

BUDNIKOV, P. P.

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USSR/Chemistry, Chemical Engineering - Heat Transfer (Contd 1) Jun 52

to the total porosity. In Ashkhabad clay with large pores, the inverse proportionality is disturbed because of convection in the pores. The heat cond coeff increases regularly with the deg of vacuum treatment and increased moisture content. In vacuum-treated plastic clays, the drop in heat cond upon removal of adsorbed water is more sharply expressed than in clay which has not been so treated. The dependence of the thermal cond coeff on the moisture content becomes greater in the course of drying. The effect of porosity on the heat cond coeff is increased by increasing the

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USSR/Chemistry, Chemical Engineering - Heat Transfer (Contd 2) Jun 52

moisture content. The temper cond coeff is not subject to a definite law under these conditions. At const moisture content, it increases with increased vacuum treatment.

218T29

BUDNIKOV, P. P.

Chemical Abst.
Vol. 48 No. 9
May 10, 1954
Glass, Clay Products, Refractories,
and Enameld Metals

Thermal conductivity and thermal diffusivity of deaerated clays. P. P. Budnikov and I. A. Al'perovich. *J. Appl. Chem. U.S.S.R.* 25, 665-73 (1952)(Engl. translation).—See *C.A.* 47, 9583c.
H. L. H.

1. BUDNIKOV, P. P.

2. USSR (600)

4. Baliankin, Dimitrii Stepanovich, 1876-

7. "Petrography of technical stone." D. S. Beliankin, B. V. Ivanov, V. V. Lapin.. Reviewed by P. P. Budnikov. Zhur. prikl. khim. 25 no. 10, 1952

9. Monthly List of Russian Accessions, Library of Congress, January 1953. Unclassified.

BUDNIKOV, P. P.

Evaporation, Clay

Effect of sulfite-alcohol slops on accelerating evaporation in clay drying. P. P. Budnikov, M. I. Khiterovich, G. S. Blokh., Dokl. AN SSSR, 82, no. 1, 1952.

SO: Monthly List of Russian Accessions, Library of Congress, April 1952 ~~1953~~, Uncl.

BUDNIKOV, P. P.

USSR/Chemistry - Refractories May 52

"Mullite - Carborundum and Corundum - Carborundum Refractories," P. P. Budnikov, V. I. Khramova, Corr Mem Acad Sci USSR

"Dok Ak Nauk SSSR" Vol 84, No 2, pp 325-328

Coke was added to a kaolin-clay mixt which was fired at 1,700-1,800° to produce mullite and carborundum or at 1,810-1,830° to produce corundum and carborundum. Further investigation showed that high-quality refractory materials could be obtained from mullite - carborundum or corundum - carborundum.

231T12

(CA 47 no. 18: 9584 '53)

BUDNIKOV, P. P.

Chemical Abst.
Vol. 48 No. 6
Mar. 25, 1954
Cement, Concrete, and
Other Building Materials

(4)

Improved silicate building materials by additions of crystallized hydrated salts. P. P. Budnikov, M. A. Matveev, and S. I. Yurchik (D. I. Mendeleev Inst. Chem. Technol., Moscow). *Doklady Akad. Nauk S.S.S.R.* 84, 1021–4(1952); cf. *Ukrain. Khim. Zhur.* 11, No. 3, 275(1936).—B. previously demonstrated that small amts. of hydrated chlorides of Na, Ca, Mg, or Na water glass solns. accelerate the hydrothermal binding reactions of free CaO in hydraulic materials if added to the mixing water. The time of the steam-curing for the production of Ca hydrosilicate bricks is abbreviated by such addns. to the batches. In the same time, the mech. properties and the H_2O stability of the bricks are improved. Particularly efficient are also natural epsomite, reichardite, astrakhanite, $FeSO_4.7H_2O$, $Na_2SO_4.10H_2O$, $CaCl_2.6H_2O$ added in amts. of 2 to 3%. $CaSO_4.2H_2O$ and $Mg(OH)_2$ are found among the reaction products, while free NaOH rapidly reacts with SiO_2 (in the quartz sand) and free CaO to form stable Ca silicate hydrates which make up the mech. strength of the products. $Mg(OH)_2$ easily reacts with activated SiO_2 to form stable Mg silicate hydrates of equal mech. character. The most effective salt addns. are granulated Na silicate and astrakhanite; the steam pressure in the autoclave is 2 to 4 atm., maintained over 4 hrs. The use of tripoli as natural activated SiO_2, besides the quartz sand, considerably increases the mech. strength data, if epsomite, astrahanite, or $Na_2SO_4.10H_2O$ (mirabilite) is added to the batch. W. E.

BUDNIKOV, P.P.; SOLOGUBOVA, O.M.

Reaction between kaolin and calcium carbonate and preparation of white cement. Doklady Akad. Nauk S.S.S.R. 85, 1127-30 '52. (MLRA 5:9)
(CA 47 no.19:10194 '53)

Budnikov, P. P.

USSR

Influence of clays of different mineral composition on the properties of clay-lime structural materials. P. P. Budnikov, I. M. Keiler, and O. S. Lavrovich (Inst. Local Structural Materials and Ministry of Building Material Ind. U.S.S.R., Moscow). *Doklady Akad. Nauk S.S.S.R.* 87, 1033–6(1952).—Addn. to lime-sand mixt. of lean clays and argillaceous soils improves phys. characteristics of the structural material subjected to hydrothermal treatment under pressure. Free silica, which is present in clays in finely dispersed state forms with $Ca(OH)_2$ a hydrocalcium silicate during the hydrothermal treatment. The formation of a compd. of kaolinite with $Ca(OH)_2$ is also not excluded. A definite relation exists between the expansion of the structural material during its wetting, its frost resistance, and the amt. of Ca hydrosilicate formed. Shapes having an expansion of over 0.12% during wetting are not frost resistant.
P. Z. Kamich

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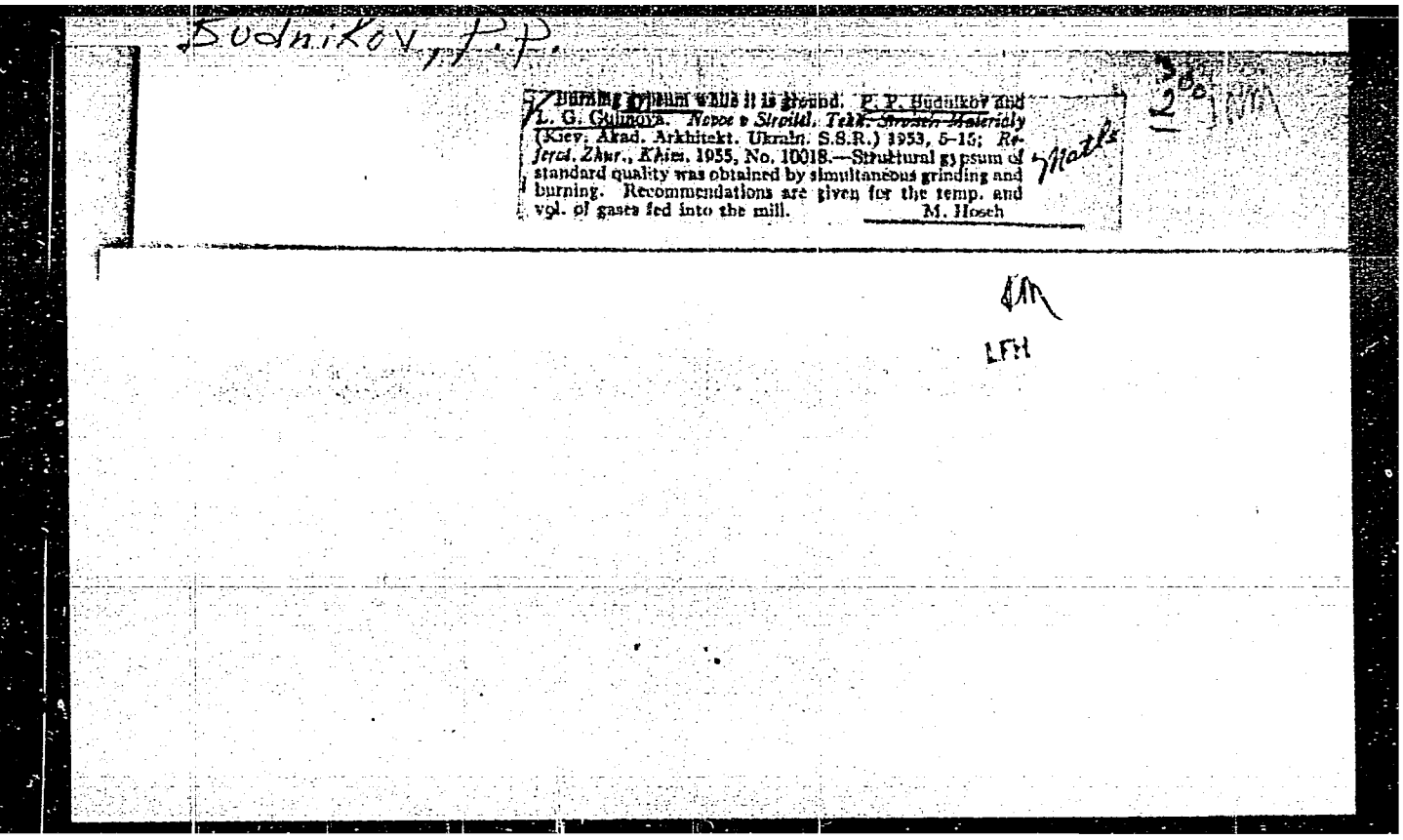
BUDNIKOV, P. P.

Granulirovannye domennye shlaki i shlakovye tsementy [Granulated blast-furnace slag and slag cements]. Moskva, Promstroiizdat, 1953. 224 p.

SO: Monthly List of Russian Accessions, Vol. 6 No. 9 December 1953



Budnikov, P.P.

Burning gypsum walls it is ground. P. P. Budnikov and L. G. Gulinova. *Novoe v Stroitel. Tekh. Stroitel. Materialy* (Kiev, Akad. Arkhitekt. Ukrain. S.S.R.) 1953, 5–15; *Referat. Zhur., Khim.* 1955, No. 10018.—Structural gypsum of standard quality was obtained by simultaneous grinding and burning. Recommendations are given for the temp. and vol. of gases fed into the mill. M. Hosch

Mats

BUDNIKOV, P. P.

Cement - Specifications

Discussing the technical specifications of cement for the great construction projects of communism. From the Section on Building Materials of the Committee on Cooperation with the Construction Agencies of Hydroelectric Power Stations, Canals and Irrigation Systems at the Presidium of the Academy of Sciences of the U.S.S.R. Izv. AN SSSR. Otd. tekh. nauk No. 1, 1953.

9. Monthly List of Russian Accessions, Library of Congress, June 1953. Unclassified.

BUDNIKOV, I. P.

USSR/Engineering - Construction, Raw Materials, Concrete — Jan 53

"Hidden Resources of the Construction Industry," P. P. Budnikov, Corr Mem Acad Sci USSR and M. I. Subbotkin, Cand Tech Sci

Vest Ak Nauk, SSSR, No 1, 1953, pp 47-50

The cement industry has completely ignored a very good source of raw material for concrete-blast furnace slag. Article discusses the problems of utilization, stating it would be a simple matter for metallurgical plants to crush cinders from their furnaces and send it to a cement plant. A

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method for use of crushed cinders has already been worked out by V. F. Krylov, V. V. Serov and others.

Melting diagram of mixtures in the system BeO-SiO_2.
P. P. Budnikov and A. M. Cherepanov. *Voprosy Petrograf. i Mineralogii, Akad. Nauk S.S.S.R.* 2, 241–4(1953).—Mixts. of BeO and SiO_2 compounded at intervals of 5 mole % and near the estd. eutectic at 1–2 mole % were shaped into cones and fired at 1500°. The cones were then melted in an oxy-hydrogen flame up to 2200° and in oxy-acetylene flame at higher temps. The melting temp. was considered the temp. at which the first drop appeared on the apex of the cone. The temp. ran from 1713 ± 20°, m.p. of 100% SiO_2, to 2570 ± 20°, m.p. of 100% BeO. The lowest temp. 1000 ± 20° was for the compn. BeO 17.5 and SiO_2 82.5 mole %. An optical analysis of the molten cones revealed a mech. mixt. of glasses contg. crystals of various modifications of SiO_2 and bromellite in various proportions. Rapid heating and rapid cooling prevented diffusion and homogenization. Phenacite, $2BeO.SiO_2$, was not observed.
M. Hosch

Chlen-korrespondent Akademii nauk SSSR.

BUDNIKOV, P.P.

3

Physicochemical properties of α- and β-modifications of calcium sulfate. P. P. Budnikov and Z. S. Kosyreva. *Voprosy Petrografii i Mineralogii, Akad. Nauk S.S.S.R.* 2, 343–9(1953).—Of the 6 known $CaSO_4$ modifications 2 were studied: α-$CaSO_4.0.5H_2O$ and β-$CaSO_4.0.5H_2O$. The α-modification is obtained in the presence of liquid H_2O in a neutral or acid medium and by fusion at 125° under 1.3 atm. pressure of water vapor. The sp. gr. of it is 2.724–2.732, its pH is 6.6, and it loses its water at 200–210°. The β-modification is obtained by dehydration of gypsum at 160–70°, its sp. gr. is 2.665–2.675, its pH is 3.9 or more, and it loses its water at 170–80°. The 2 differ in their cryst. structure and their optical properties. The thermograms of the 2 modifications also differ. The endothermal dehydration effect of α is at 190–210°, while that of the β-hemihydrate is at 170–85°. The β-hemihydrate has an exothermal effect at 360–70°, the α-hemihydrate has no exothermal effect. The α-hemihydrate has a lower water/gypsum ratio (0.35–0.45) than does the β-modification (0.60–0.80) and a higher compression strength, 282 *vs.* 110 kg./sq. cm. The α-modification absorbed H_2O slower than did the β and was more hygroscopic. The heat of hydration of β was higher and the max. was reached faster. This is attributed to its finer crystals. The α-hemihydrate dissolved appreciably slower. The expansion upon setting of the β was 3 times as great as that of the α-hemihydrate. M. Hoseh

BUDNIKOV, P.

Journal of Applied Chemistry
Vol. 4 Feb. 1954
Chemical Engineering and Electrochemical

Expansile Portland cement without formation of calcium-hydro-sulphate. P. Budnikov and S. Kossyreva (*Silikat Tech.*, 1953, 4, 128; *Brit. ceram. Abstr.*, 1953, 359A).—Previous methods were based on the reactions between $4CaO,Al_2O_3$ and plaster or between $CaO.Al_2O_3$ or $5CaO.3Al_2O_3$ and plaster. According to the method proposed, calcined dolomite in quantities of 5—7% is added to the Portland cement. The production process is simple. The expansion of such cements amounts to 0·16—0·40%.

BRIT. CERAM. RES. ASS. (*Cl*).

(3)

Unfired gypsum cement. P. P. Budnikov, I. G. Gulinova, and V. A. Ipat'eva. *Doporodi Akad. Nauk Ukr. R.S.R.*, 1953, No. 4, pp. 231–35.—Unfired gypsum cement can be obtained by ball milling the $CaSO_4 \cdot 2H_2O$ to a fine degree, by wet or dry method, without the addition of activators. The high strength of such cement is due to its capacity to form supersaturated solutions and to recrystallize. The finer the grind, the more complete is the recrystallization process and the greater is the cement strength. The hardened cement has a fine crystalline structure. To attain a crushing strength of 250 to 350 kg./cm.², ground gypsum should give a 3.5% residue on a sieve of 10,000 openings per sq. cm. Suggested additions to increase water resistance are about 2% $Ca(OH)_2$, basic blast-furnace slag, or schist ash; these should be introduced during the grinding of the original gypsum. R.Z.K.

Budnikov, P.P.

The effect of clay components on the properties of limestone-clay products. P. P. Budnikov, I. M. Keller, and O. S. Lavrovich. *Sbornik Trudov Resp. Nauch.-Issledovatel. Inst. Mestnykh Stroitel. Materialov* 1953, No. 5, 3–14; *Referat. Zhur., Khim.* 1954, No. 50399; cf. *C.A.* 49, 12810*h*.—Tests of compression strength showed that addn. of unwashed clay increases the strength whereas addn. of clay free of sand lowers the strength of ceramic specimens. Thermographic investigation showed that after treating a mixt. of 85% quartz sand and 16% lime with steam there was an endothermal effect at 180° and an exothermal effect at 900°. A steam-treated mixt. of kaolin 92 and lime 8% had an endothermal effect at 370°. The suitability of a raw material for lime-clay brick depends largely on its mineralogical compn. M. Hoscheit

(2)

STOL'NIKOK, V.V.; GUBAR', A.S.; BUDNIKOV, P.P., chlen-korrespondent.

Use of fine-grain sands for hydrotechnical concrete. Izv.AN SSSR Otd. tekh.nauk no.5:681-690 My '53. (MLRA 6:8)

1. Akademiya nauk SSSR (for Budnikov). (Concrete)

BUDNIKOV, P. P.

USSR/Engineering - Construction, Materials — Jun 53

"Rock Wool as Means for the Conservation of Building Materials," P. P. Budnikov, Corr Mem Acad Sci USSR, K. E, Goryaynov

Iz Ak Nauk SSSR, OTN, No 6, pp 918-924

Stating that rock wool industry has been developed in Soviet Union only in postwar years, reviews scientific works in this field and discusses utilization of rock wool as basic component in heat

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insulating materials and as partial substitute for asbestos in asbestos-cement products.

Dielectric analysis in application to investigations of the change of minerals during heating. P. P. Budnikov, V. M. Barno, and O. P. Mchedlishvili-Petriashvili (Mendeleev Chem.-Technol. Inst.). *Soobshcheniya Akad. Nauk Gruzin. S.S.R.* 14, No. 1, 27-31(1953).—A method of dielec. analysis is given, including continuous recording of the change of dielec. properties of the substance studied over the total period. The app. consisted of special Pt electrodes in the form of 2 different-sized crucibles, one placed inside the other and placed in a Pt elec. furnace, heated by a controlled source. The measuring app. consisted of a bridge of the a.-c. type with balance indicated by a "magic eye." Accuracy of measurements of capacity and resistance was 5% in the temp. intervals up to 700°. As an example, some Georgian serpentinite was studied from 100° to 700°. A sharp decrease in the capacity found at 200° was connected with loss of moisture. The effect shown between 300° and 350° was caused by the presence of impurities. The increase of capacity beginning at 450° was caused by dissocn. of $MgCO_3$, and at 640° the strong weakening was connected with the serpentinite mol. A diagram of the arrangement of the app. was shown. Some heating curves were also provided. Gladys S. Macy

BUDNIKOV, P. P.

(2)

1254. Investigation of reactions between kaolin and calcium carbonate and the production of white cement.—P. P. BUDNIKOV and O. M. SOLOGUBOVA (*Silikat Tech.*, 4, 503, 1953). It is possible to produce a white hydraulic cement from kaolin and chalk with an addition of 10% gypsum as a mineralizer. The latter promotes the formation of $2CaO.SiO_2$ and $CaO.Al_2O_3$ and improves the hydraulic properties. The whiteness of this cement reaches 87%; density is 2·471; crushing-strength, 5,000–5,700 lb sq.in.; tensile strength, 455 lb/sq.in (6 figs., 9 tables)

BUDNIKOV, P.P.

Chemical Abst.
Vol. 48
Apr. 10, 1954
Cement, Concrete, and Other Building Materials

Reaction between kaolin and calcium carbonate in white-cement production. P. P. Budnikov and O. M. Solomatova (D. I. Mendeleev Inst. Chem. Technol., Moscow). *Ukrain. Khim. Zhur.* 19, No. 1, 92-101(1953); *Silikattech.* 4, 503-5 (1953); cf. *C.A.* 47, 10194i.—A belitic aluminate cement is produced from a raw mix of kaolin (1 part), chalk (2 parts), and gypsum (10%) added as mineralizer, by burning at 1200° (as optimum). The clinker is milled with anhydrite, and the cement produced is characterized by its high mech. strength. The albedo of the cement is remarkably high, because of its low contamination by Fe_2O_3 (less than 0.4%), namely 87%, with baryte as 100% albedo standard. The fundamental reactions in the raw mixes are illustrated by the differential thermal curves, and simple heating curves, which show endothermic effects of the kaolin dehydration, the decarbonation of the chalk, and the exothermic formation of $CaO.Al_2O_3$, with a sharp peak above 1000°. In the same time, CaO and SiO_2 react to form $2CaO.SiO_2$. The reactions are also studied by measurements of the elec. cond. of the solid pellets. It is concluded that no liquid phases occur up to 1200°. The examn. of thin sections showed $CaO.Al_2O_3$ and $2CaO.SiO_2$ as typical clinker minerals, anorthite and gehlenite as (nonhydraulic) accessories. In the gypsum-contg. batches, no free CaO was observed above 1100° while the mixes without gypsum contained even at 1300° 0.3% free CaO and no $3CaO.Al_2O_3$. The clinker powder, blended with 3% $CaSO_4.\frac{1}{2}H_2O$, or 5% anhydrite shows improved mech. strengths in the hydrated mortar samples. No detrimental ettringite is formed; the microscopic inspection of the hydration products showed only $2CaO.Al_2O_3.7H_2O$ and $2CaO.SiO_2.nH_2O$. The differential thermal analysis of mortars 28 days old shows a strong exothermic reaction at 290° to 410° and a second at 810° to 910°, which is interpreted as the formation of $CaO.Al_2O_3$ from $2CaO.Al_2O_3.7H_2O$. The dehydration of $2CaO.Al_2O_3.7H_2O$ at 320° to 340° is endothermic. W. Eitel

BUDNIKOV, P.P.

Moskovskiy khimiko-tekhnologichekiy institutt

Melting-point diagram of the system $MgO-CaF_2$. P. P. BUDNIKOV AND S. G. TRESVYATSKII. *Ukrain. Khim. Zhur.*, 19 [6, 662-33 (1953).—The system $MgO-CaF_2$ was studied by determination of cones and thermal analysis. Melting points of mixtures containing 70% MgO + 30% CaF_2, 80% MgO + 20% CaF_2, and 90% MgO + 10% CaF_2 were not determined because of the high volatility of MgO and CaF_2. The melting point diagram was plotted, and a eutectic of 18 molecular % MgO and 82 molecular % CaF_2 melting at 1350°C. was established. Liquidus and solidus lines were determined to a composition of 51.7 molecular % MgO and 48.3 molecular % CaF_2. B.Z.K.

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BUDNIKOV, P. P.

USSR/Chemistry - Lithium Compds　　Jul 53

"Lithium Compounds in Silicates," P.P. Budnikov and A.M. Cherepanov (Moscow)

Usp Khim, Vol 22, No 7, pp 821-837

Summarizes in some detail information on the crystal chem, mineralogy, and phys properties on naturally occurring Li silicates. Discusses the properties of the lithium-bearing minerals amblygonite, lepidolite, petalite, and spodumene from the standpoint of their use in the production of fluxes enamels, glosses, ceramics and other phases

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of the silicate industry. The bibliography, consisting of 50 references, is entirely from Western sources.

Sep 53

BUDNIKOV, P. P., REVIEWER

USSR/Chemistry - Chemical Technology

"Review of S. I. Vol'fkovich, A. P. Yegorov and D. A. Epshteyn's book 'General Chemical Technology (Obshcheye Khimicheskaye Tekhnologiya)' Vol I, 632 pp, Goskhimizdat, Moscow, 1953." (P. P. Budnikov, reviewer)

Usp Khim, Vol 22, No 9, pp 1165-1168

In this book material is organized on the basis of similarity of technol processes and partly on the basis of common raw material source. The section on thermal treatment of fuels discusses pyrolysis of solid fuel, conversion of petroleum and natural gas, and gasification of solid fuel, including subterranean gasification. Development of the chem ind during prewar 5-yr plans and the leading USSR chem schools are discussed. The section on basic inorganic synthesis describes new processes for production of conc HNO_3 by direct synthesis and combined production of HNO_3 and H_2SO_4. While the book has some shortcomings, it is a valuable textbook for higher educational institutions.

268T17

Corrosion of slag portland cements and their utilization in hydraulic structures. P. P. Budnikov and K. G. Krut. *J. Appl. Chem. U.S.S.R.* [redacted] (Engl. translation).—See *C.A.* 48, 4109c.

H. L. H.

BUDNIKOV, P.P.

Cements, Slimes, + Plasters

Corrosion of slag-Portland cements and their possible utilization in hydraulic structures. P. P. BUDNIKOV AND K. G. KRUT. *Zhur. Priklad. Khim.*, 26 [3] 237–50 (1953).—The resistance of slag-Portland cements to corrosion is determined by the mineralogical composition of the original clinker, nature of the granular slag, and amount of slag. Resistance can be raised by varying the mineralogical composition of clinker or by admixtures. It is desirable to use different types of cements for sections of hydraulic structures subject to different types of attack. For one type of cement, the mineralogical composition should meet the requirement of stability against corrosion in 1% $MgSO_4$. Acid blast-furnace slags provide increased resistance to magnesia (sea water) and sulfoaluminate (1% $MgSO_4$) attack. Basic blast-furnace slag is somewhat less effective than acid slag in 5% Na_2SO_4. Acid slag with up to 90% glass and up to 15.5% Al_2O_3 proved most effective in raising the resistance. Slag-sulfated cement and Portland cements with 15% tripoli can be used in hydraulic structures, except in zones of variable water level. Cement containing much belite and up to 3% tricalcium aluminate should be used in zones of variable sea-water level. Surface condition and density are also important factors in resistance. The surface should be treated with H_2SiF_6 or CO_2. B.Z.K.

Budnikov, P. P.

Production of building brick from clay and lime. P. P. Budnikov and S. I. Khvostenkov. *J. Appl. Chem. U.S.S.R.* 26, 421-6(1953)(Engl. translation).—See *C.A.* 48, 6093a. H. L. H.

BUDNIKOV, P.P.

Jour. of the Amor.
Ceramic Soc.
Vol. 37 No. 3
March 1954
Coments, Limes, and
Plasters

Study of conditions of formation of clay-lime structural materials. P. P. Budnikov and S. I. Khvostenkov. *Zhur. Prikład. Khim.*, 26 [5] 457-63 (1953). Various clay-lime specimens were tested by chemical, thermographic, and mechanical methods before and after hydrothermal treatment to determine the effect of technological factors on hardening. Data (tabulated and graphical) are given on chemical composition, dehydration, strength as a function of the temperature of preliminary treatment of clay, strength as a function of steam pressure in the autoclave, strength vs. CaO content in mixtures, strength vs. pressure of shaping, and strength vs. degree of moistening. B.Z.K.

VIZIR, V.A., redaktor; BUDNIKOV, P.P. [reviewer].

"Transactions of the Kiev Technological Silicates Institute of the U.S.S.R. Ministry of Higher Education, vol. 3." V.A.Vizir, ed. Reviewed by P.P. Budnikov. Zhur.prikl.khim. 26 no.9:1000-1002 S '53. (MLRA 6:10)
(Silicates) (Vizir, V.A.)

BUDNIKOV, P. P.; TREVYATSKIY, S. G.

Calcium Compounds

Fusibility diagram for the system CaO - CaF_2. Dokl. AN SSSR 89, No. 3, 1953.

9. Monthly List of Russian Accessions, Library of Congress, June 1953, Uncl.

Budnikov, P. P.

The influence of sulfite waste liquor on the shearing stress limit of a clayey mass. P. P. Budnikov and G. S. Blokh. *Doklady Akad. Nauk S.S.S.R.* 89, 897-900 (1953).—Addns. of sulfite-waste liquor to ceramic clays increase their plasticity, and thus decrease the quantity of water required for forming the clays improve uniformity of the mixts. and accelerate the drying during manuf. of clay parts. The action is attributed to surface-tension effects, which decreases cohesion of the particles. Similar additives applied to cement pastes produce similar results.

A. Luksch

(1)

BUDNIKOV, P.P.

Theory of hardening of lime-clay-sand building materials by hydrothermal treatment. P. P. Budnikov and O. V. Kivnia (Dokl. Akad. Nauk. SSSR, [illegible]1102).—Sand–lime–kaolin mixtures, briquetted and then heated in steam at 8 atm., are found to increase in ultimate compressive strength with content of kaolin, indicating reaction of kaolin with CaO. Microscopical observations on pure kaolin after exposure to a similar treatment show that it causes a weakening of the bond between Si–O tetrahedra and Al atoms permitting reaction of both SiO_2 and Al_2O_3 with CaO.

R. C. MURRAY.

USSR .

NO 2.

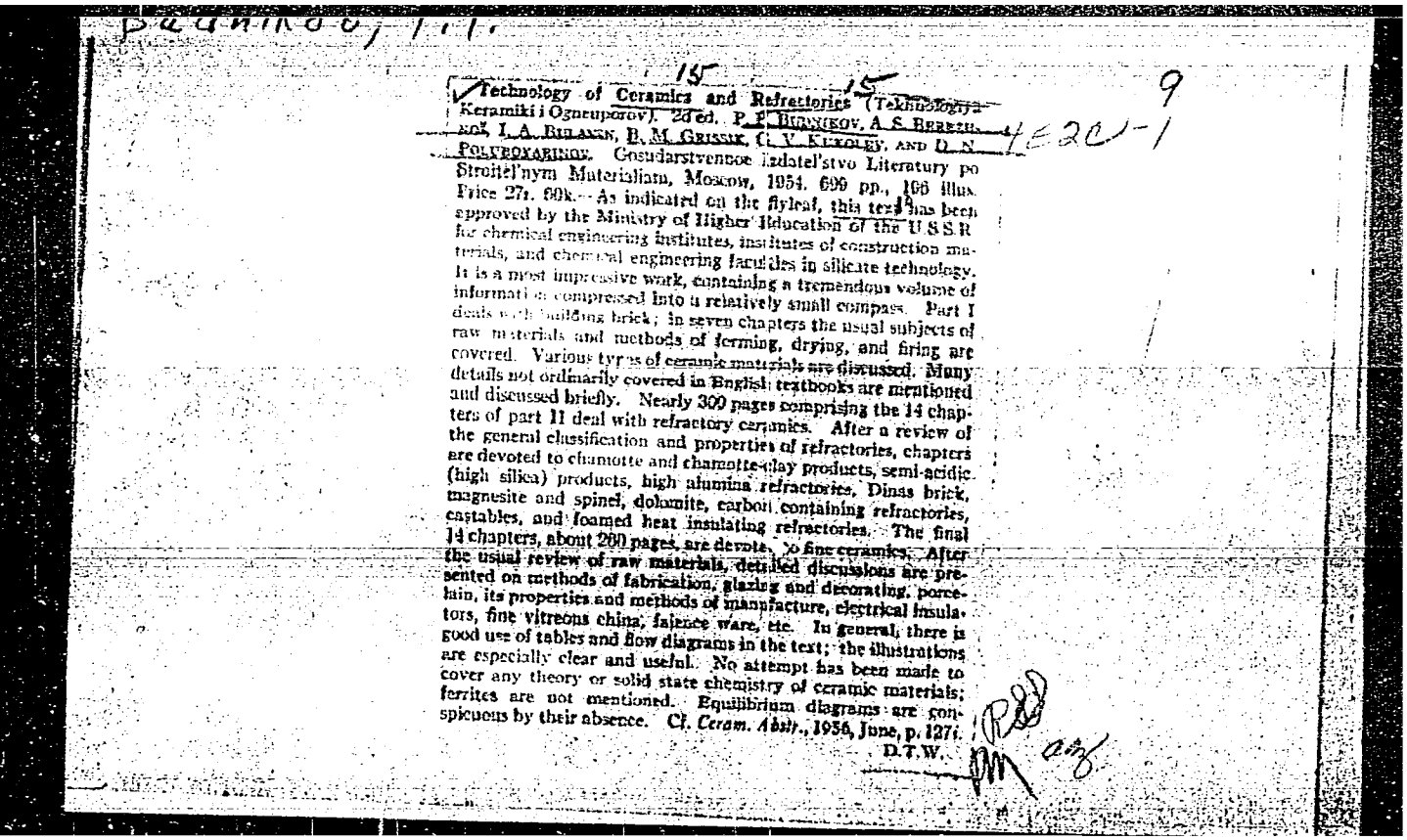
2293. The accuracy of the Al_2O_3-SiO_2 equilibrium diagram.—P. P. Budnikov, S. G. Tresvyatskii, and V. I. Kosyakovskii (*C.R. Acad. Sci. U.R.S.S.*, 95, 281, 1953). N. A. Toropov and F. Ya. Galakhov (*Dok. Akad. Nauk.*, 78, No. 2, 299, 1951) investigating the system Al_2O_3-SiO_2 in the region of high Al_2O_3 content, found that mullite melts without decomposing. Experiments made by N. F. Filonenko and I. V. Lavrov (*Ibid.*, 89, No. 1, 141, 1953) did not confirm these findings. In attempting to settle this problem the present authors used high-temperature thermal analysis with a W-Mo thermocouple, which is claimed to be suitable for the purpose if very pure metal wire is used despite previous doubts in the literature; repeated heating of the W-Mo thermocouple gave maximum deviations of 20° C. Thermocouples were made of W and Mo wires 1·0 and 0·8 mm. dia. welded in an electric arc in a neutral gas atmosphere to prevent oxidation. During the investigation the thermocouples were protected by gas-tight magnesia tubes. The results of the investigation were mikroscopic and X-ray analyses were in agreement with those obtained by Toropov and Galakhov, i.e. that mullite melts without decomposing. (3 figs., 1 table.)

BUDNIKOV, P.P.

BUDNIKOV, P.P., redaktor; IVANOV, F.M., redaktor; GRAKOVA, Ye.D., tekhnicheskiy redaktor

[Corrosion of concrete and ways to control it; transaction of the 1953 conference] Korroziia betona i mery bor'by s nei; trudy konferentsii 1953 g. Moskva, Izd-vo Akademii nauk SSSR, 1954. 255 p. (MLRA 8:4)

1. Konferentsiya po korrozii betona, Moscow, 1953. 2. Chlen-korrespondent Akademii nauk SSSR (for Budnikov).
(Concrete--Corrosion)



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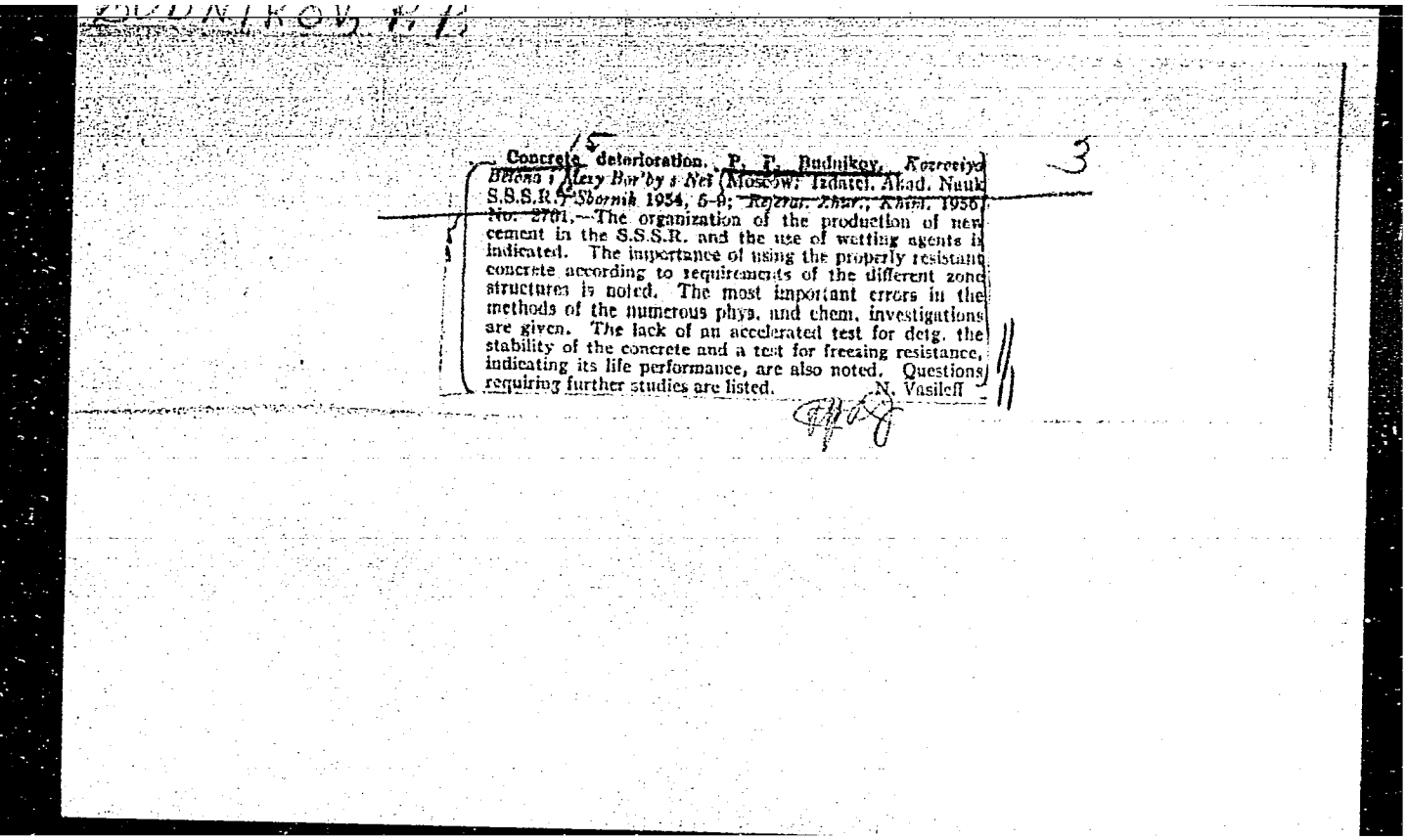
Technology of Ceramics and Refractories (Tekhnologiya Keramiki i Ogneuporov). 2d ed. P. P. BUDNIKOV, A. S. BERDUN, A. A. BULANOV, B. M. GRISSIK, G. V. KUKOLEV, AND D. N. POLUBOYARINOV. Gosudarstvennoe Izdatel'stvo Literatury po Stroitel'nym Materialam, Moscow, 1954. 696 pp., 166 illus. Price 27r. 60k. As indicated on the flyleaf, this text has been approved by the Ministry of Higher Education of the U.S.S.R. for chemical engineering institutes, institutes of construction materials, and chemical engineering faculties in silicate technology. It is a most impressive work, containing a tremendous volume of information compressed into a relatively small compass. Part I deals with building brick; in seven chapters the usual subjects of raw materials and methods of forming, drying, and firing are covered. Various types of ceramic materials are discussed. Many details not ordinarily covered in English textbooks are mentioned and discussed briefly. Nearly 300 pages comprising the 14 chapters of part II deal with refractory ceramics. After a review of the general classification and properties of refractories, chapters are devoted to chamotte and chamotte-clay products, semi-acidic (high silica) products, high alumina refractories, Dinas brick, magnesite and spinel, dolomite, carbon containing refractories, castables, and foamed heat insulating refractories. The final 14 chapters, about 260 pages, are devoted to fine ceramics. After the usual review of raw materials, detailed discussions are presented on methods of fabrication, glazing and decorating, porcelain, its properties and methods of manufacture, electrical insulators, fine vitreous china, faience ware, etc. In general, there is good use of tables and flow diagrams in the text; the illustrations are especially clear and useful. No attempt has been made to cover any theory or solid state chemistry of ceramic materials; ferrites are not mentioned. Equilibrium diagrams are conspicuous by their absence. Cf. *Ceram. Abstr.*, 1956, June, p. 127i.

D.T.W.



Concrete deterioration. P. F. Pudnikov. *Korroziya Betona i Zhelezo-Betona v Sooruzheniyakh S.S.S.R.* (Moscow: Izdatel. Akad. Nauk S.S.S.R.) *Sbornik* 1954, 6-9; *Referat. Zhur., Khim.* 1956, No. 27001.—The organization of the production of new cement in the S.S.S.R. and the use of wetting agents is indicated. The importance of using the properly resistant concrete according to requirements of the different zone structures is noted. The most important errors in the methods of the numerous phys. and chem. investigations are given. The lack of an accelerated test for detg. the stability of the concrete and a test for freezing resistance, indicating its life performance, are also noted. Questions requiring further studies are listed. N. Vasileff

USSR/ Chemistry - Physical chemistry

Card 1/1 Pub. 104 - 2/12

Authors : Budnikov, P.P., Memb. Corresp. of Acad. of Sc. USSR and Active Memb. of Ukr-Acad. of Sc.

Title : Effect of mineralizers on the mechanical, thermal and dielectric properties of porcelain

Periodical : Stek. i ker. 1, 4-7, Jan 1954

Abstract : Various means of improving the technical properties of porcelain electrical insulators, are discussed. The improvement of the mechanical, thermal and dielectric properties of porcelain insulators was found to be connected with the reduction in the number of alkali metal ions in the vitreous phase and increase in the mullite (aluminum silicate refractory) content in the mass. Actual experiments showed that the introduction into the ceramic mass of a small amount (1-3%) of a mineralizing agent - MnO, MgO, TiO_2, CaF_2 etc.- will not only increase the mullite content but will also make possible the reduction of the kilning temperature. Tables; illustrations.

Institution: .....
Submitted: .....